

GLENCOE



South Carolina Algebra 1 End-of-Course Test Practice and Preparation Workbook

Consultant

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Test-Taking Tips

- Go to bed early the night before the test. You will think more clearly after a good night's rest.
- Read each problem carefully and think about ways to solve the problem before you try to answer the question.
- Relax. Most people get nervous when taking a test. It's natural. Just do your best.
- Answer questions you are sure about first. If you do not know the answer to a question, skip it and go back to that question later.
- Think positively. Some problems may seem hard to you, but you may be able to figure out what to do if you read each question carefully.
- If no figure is provided, draw one. If one is furnished, mark it up to help you solve the problem.
- When you have finished each problem, reread it to make sure your answer is reasonable.
- Become familiar with a variety of formulas and when they should be used.
- Make sure that the number of the question on the answer sheet matches the number of the question on which you are working in your test booklet.

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South Carolina
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Algebra 1 End-of-Course Examination Objectives

In Algebra 1, students build upon the mathematical understandings that are addressed in prekindergarten through the eighth grade. Students will:

- use symbolic reasoning to represent mathematical situations, to express generalizations, and to study relationships among quantities;
- use functions to represent and model problem situations as well as to analyze and interpret relationships;
- set up equations in a wide range of situations and use a variety of methods to solve them; and
- use problem solving, representation, reasoning and proof, language and communication, and connections both within and outside mathematics.

In Algebra 1, hand-held graphing calculators are required as part of instruction and assessment. Students should use a variety of representations (concrete, numerical, algorithmic, graphical), tools (matrices, data), and technologies to model mathematical situations to solve meaningful problems. The technologies include, but are not limited to, powerful and accessible hand-held calculators as well as computers with graphing capabilities.

I. Understanding Functions

A. Relationships

1. Describe independent and dependent quantities in functional relationships.
2. Gather and record data or use data sets to determine functional (systematic) relationships between quantities.
3. Describe functional relationships for given problem situations and write equations, inequalities, and recursive relations to answer questions arising from the situations.
4. Represent relationships among quantities using concrete models, tables, graphs, diagrams, verbal descriptions, equations, and inequalities including representations involving computer algebra systems, spreadsheets, and graphing calculators.
5. Make judgments about units of measure and scales within a system and between systems.
6. Interpret and make inferences from explicit and recursive functional relationships.

B. Linear and Quadratic Functions and Data Representations

1. Identify and sketch the general forms of linear ($y = x$) and quadratic ($y = x^2$) parent functions.
2. For a variety of situations, identify and determine reasonable domain and range values for given situations.
3. Interpret situations in terms of given graphs or create situations that fit given graphs.
4. Represent, display, and interpret data using scatterplots, bar graphs, stem-and-leaf plots, and box-and-whiskers diagrams, including representations on graphing calculators and computers.
5. Write a linear equation that fits a data set, check the model for "goodness of fit," and make predictions using the model.

C. Generalizations, Algebraic Symbols, and Matrices

1. Read, write, and represent very large and very small numbers in a variety of forms including exponential.

2. Use unit analysis to check measurement computations.
 3. Given situations, determine patterns and represent generalizations algebraically.
 4. Use symbolic representation, reasoning, and proof to verify statements about numbers.
 5. Recognize and justify the relationship between the magnitude of a number and the application of specific operations.
 6. Identify and use properties related to operations with matrices (addition, subtraction, and scalar multiplication) to solve applied problems.
- D. Algebraic Expressions in Problem Solving Situations**
1. Find specific function values and evaluate expressions.
 2. Simplify polynomial expressions and perform polynomial arithmetic.
 3. Transform and solve equations and inequalities, factoring as necessary in problem situations.
 4. Given a problem situation, determine whether to use a rough estimate, an approximation, or an exact answer. Select a suitable method of computing from techniques such as the use of mental mathematics, paper-and-pencil combinations, calculators, and computers.
 5. Use supporting data to explain why a solution is mathematically reasonable.
 6. Use the commutative, associative, and distributive properties to simplify algebraic expressions.

II. Linear Functions

A. Representations

1. Determine whether or not given situations can be represented by linear functions.
2. Based on the constraints of the problem, determine the domain and range values for linear functions.
3. Translate among and use algebraic, tabular, graphical, or verbal descriptions of linear functions using computer algebra systems, spreadsheets, and graphing calculators.

B. Interpretations

1. Develop the concept of slope as rate of change and determine slope from graphs, tables, and algebraic representations.
2. Interpret the meaning of slope and intercepts in situations using data, symbolic representations, or graphs.
3. With and without using a graphing calculator, investigate, describe, and predict the effects of changes in m and b on the graph of $y = mx + b$.
4. Graph and write equations of lines given characteristics such as two points, a point and a slope, or a slope and y -intercept.
5. Determine the intercepts of linear functions from graphs, tables, and algebraic representations.
6. With and without using a graphing calculator, interpret and predict the effects of changing slope and y -intercept in applied situations.
7. Relate direct variation to linear functions and solve problems involving proportional change.

C. Equations and Inequalities

1. Analyze situations involving linear functions and formulate linear equations or inequalities to solve problems.
2. Investigate methods for solving linear equations and inequalities using concrete models, graphs, and the properties of equality; select a method and solve the equations and inequalities.
3. Use the commutative, associative, distributive, equality, and identity properties to justify the steps in solving equations and inequalities.
4. Using concrete models for given contexts, interpret and determine the reasonableness of solutions to linear equations and inequalities.

D. Systems of Linear Equations

1. Analyze situations and formulate systems of linear equations to solve problems.
2. Solve systems of linear equations using concrete models, graphs, tables, and algebraic methods including computer algebra systems, spreadsheets, and graphing calculators.
3. For given contexts, interpret and determine the reasonableness of solutions to systems of linear equations.

III. Quadratic and Other Functions

A. Quadratic Functions

1. Given the constraints of the problem, determine the domain and range values for quadratic functions.
2. With and without using a graphing calculator, investigate, describe, and predict the effects of changes in the coefficient a on the graph of $y = ax^2$.
3. With and without using a graphing calculator, investigate, describe, and predict the effects of changes in the constant c on the graph of $y = x^2 + c$.
4. For problem situations, analyze graphs of quadratic functions and draw conclusions.
5. Solve quadratic equations using concrete models, tables, graphs, and algebraic methods that include factoring and using the quadratic formula as well as computer algebra systems, spreadsheets, and graphing calculators.
6. Relate the solutions of quadratic equations to the roots of their functions.

B. Other Functions

1. Use patterns to generate the laws of exponents and apply the laws of exponents in problem-solving situations.
2. Analyze data and represent situations involving inverse variation using concrete models, tables, graphs, or algebraic methods as well as computer algebra systems, spreadsheets, and graphing calculators.
3. Analyze data and represent situations involving exponential growth and decay using concrete models, tables, graphs, or algebraic methods as well as computer algebra systems, spreadsheets, and graphing calculators.



Name: _____

Date: _____

Standards Practice

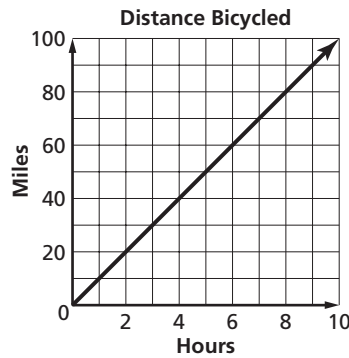
Understanding Functions I.A.1.

Describe independent and dependent quantities in functional relationships.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

1 The graph shows the amount of time Herbie has scheduled to bicycle 30 miles in Sumter National Forest. Which is true about the graph?

- A The number of hours is the independent variable because time is not dependent on distance.
- B The number of miles is the independent variable because how far Herbie rides does not depend on how much time he has.
- C The number of hours is the dependent variable because how long the ride takes depends on Herbie's speed.
- D The number of miles Herbie rides depends on how many times he stops for breaks.
- E Both the number of hours and the number of miles depend on Herbie's ability to bicycle.



1 **A**

2 In $p(k) = k^2 + k - 4$, which is the independent variable?

- A -4
- B 4
- C k
- D k^2
- E p

2 **C**

3 The formula $h = 0.66m^2$ represents the number of miles m that can be seen when flying at a height of h feet. Which is the dependent variable?

- A 0.66
- B $0.66m$
- C m
- D m^2
- E h

3 **E**

Read each question carefully and write your answer in the space provided. Be sure to show all your work.

4 What is a dependent variable? [2] ←

Sample answer: A variable that is a function of another variable.

Note: Explain to students that the value in the brackets indicates how many points, from 1 to 5, the question is worth. Students should expect to show more work for questions worth more points.

For more practice, see Lessons 6-5, 7-4, and INV 7 in Algebra 1.



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Standards Practice

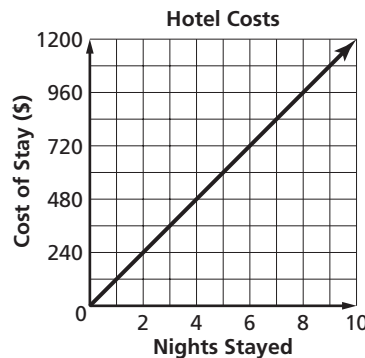
Understanding Functions I.A.2.

Gather and record data or use data sets to determine functional (systematic) relationships between quantities.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1 The graph shows hotel costs in Myrtle Beach. What relationship, if any, is shown in the graph?

- A Hotels are very expensive.
 B The cost c to spend n nights is represented by $c = 120n$.
 C A vacation in Myrtle Beach will cost \$120.
 D The more nights you stay in the hotel, the less you pay per night.
 E There is no relationship between your total room cost and the number of nights you stay.

1 **B**

- 2 Which data table corresponds to the function $y = 2x - 1$?

A

| | | | | |
|---|----|----|----|---|
| x | -2 | -1 | 0 | 1 |
| y | -5 | -3 | -1 | 1 |

B

| | | | | |
|---|----|----|---|---|
| x | -2 | -1 | 0 | 1 |
| y | -4 | -2 | 0 | 2 |

C

| | | | | |
|---|----|----|---|---|
| x | -2 | -1 | 0 | 1 |
| y | -5 | -3 | 0 | 2 |

D

| | | | | |
|---|----|----|----|---|
| x | -2 | -1 | 0 | 1 |
| y | -3 | -2 | -1 | 1 |

E

| | | | | |
|---|----|----|----|---|
| x | -2 | -1 | 0 | 1 |
| y | 3 | 1 | -1 | 1 |

2 **A**

Read each question carefully and write your answer in the space provided. Be sure to show all your work.

- 3 Fill in the missing y -values so that the table describes a linear relationship. Explain how you decided what y -values to use. [3]

| | | | | | | |
|---|----|----|---|----------|----------|-----------|
| x | -2 | -1 | 0 | 1 | 2 | 3 |
| y | -4 | -1 | 2 | 5 | 8 | 11 |

Sample answer: The x -values increase by 1 as you go from left to right. The given y -values increase by 3 as you go from left to right. All of the remaining y -values should follow the same pattern.

For more practice, see Lessons 6-3, 6-4, INV 6, 6-5, 7-2, 7-3, 7-4, INV 7, 7-5, 7-6, 7-7, 11-1, 11-2, 11-3, 11-7, and 14-5 in Algebra 1.



Name: _____

Date: _____

Standards Practice

Understanding Functions I.A.3.

Describe functional relationships for given problem situations and write equations, inequalities, and recursive relations to answer questions arising from the situations.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1 Brooke records how many birds visit her bird feeder each day in the first week of spring. The numbers of birds are: 7, 11, 15, 19, 23, 27, and 31. How is this sequence written as a recursive relation?

A $a_n = 7 + 4n$

B $a_n = 7 + 4$

C $a_n = 7n$

D $a_n = 3 + 4n$

E $a_n = 7 + 4(n + 1)$

1 **D**

- 2 On walking tours of historic Charleston, one tour guide accompanies 12 tourists. Two tour guides are needed for 24 tourists, and three tour guides are needed for 36 tourists. If the pattern continues, how many tour guides are needed for 108 tourists?

A 8

B 9

C 10

D 12

E 14

2 **B**

- 3 The time t to walk one trail in Francis Marion National Forest is more than 75 minutes. How is this written as an inequality?

A $t > 75$

B $t \geq 75$

C $t = 75$

D $t \leq 75$

E $t < 75$

3 **A**

Read each question carefully and write your answer in the space provided. Be sure to show all your work.

- 4 Write the first four terms of the sequence $a_n = 2(n - 1)$. [2]

0, 2, 4, 6

- 5 Everett can fit up to 9 CDs c in a box to ship to a customer. How is this written as an inequality? [2]

$c \leq 9$

For more practice, see Lessons INV 3, 6-1, 6-2, 6-3, 6-4, INV 6, 6-5, 7-2, 7-3, 7-4, INV 7, 7-5, 7-6, 7-7, 11-1, 11-2, 11-3, 11-7, 12-1, 12-2, 12-3, 12-4, 12-5, 12-6, 12-7, and 14-5 in Algebra 1.



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Standards Practice

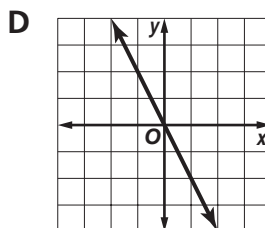
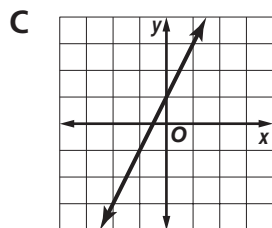
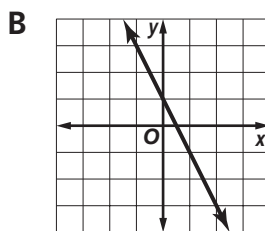
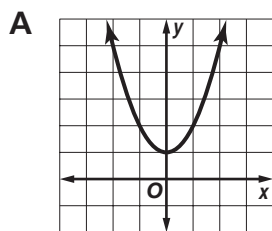
Understanding Functions I.A.4.

Represent relationships among quantities using concrete models, tables, graphs, diagrams, verbal descriptions, equations, and inequalities including representations involving computer algebra systems, spreadsheets, and graphing calculators.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1 Which graph contains the points in the table?

| | | | | | | |
|-----|----|----|---|----|----|----|
| x | -2 | -1 | 0 | 1 | 2 | 3 |
| y | 5 | 3 | 1 | -1 | -3 | -5 |

1 **B**

- 2 Which graph is shown on the graphing calculator?

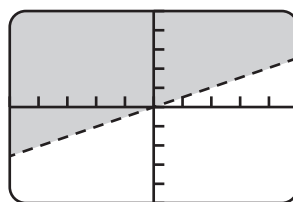
A $y > \frac{1}{2}x$

B $y \geq \frac{1}{2}x$

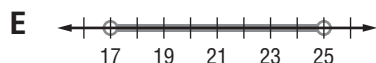
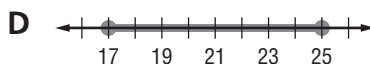
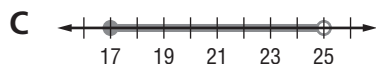
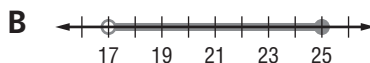
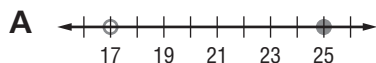
C $y = \frac{1}{2}x$

D $y \leq \frac{1}{2}x$

E $y < \frac{1}{2}x$

2 **A**

- 3 Madeline's Floral Boutique uses a size of vase that will accommodate more than 17 but no more than 25 flowers. Which graph represents the number of flowers in the vase?

3 **B**



Name:

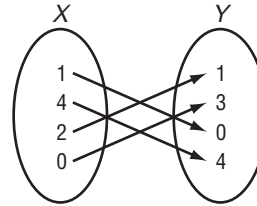
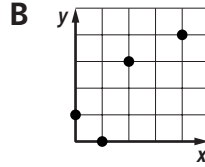
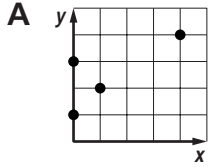
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Standards Practice

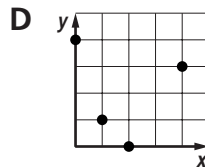
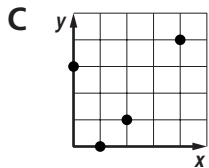
Understanding Functions I.A.4. (continued)

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 4 Which graph represents the relationship in the diagram?



4 **C**



Read each question carefully and write your answer in the space provided. Be sure to show all your work.

- 5 A dog boarding kennel in Columbia hires one part-time assistant for each group of 8 dogs. Write an equation to represent the relationship between the number of assistants a and the number of dogs d . [2]

$$a = \frac{d}{8}$$

- 6 Joaquin is making a spreadsheet for a class paper on how Spanish moss was harvested, cured, and packed in bales during the 1930s. Complete the spreadsheet based on the pattern shown. [3]

| | A | B |
|---|-----------------|-------------------------|
| 1 | number of bales | weight of moss (pounds) |
| 2 | 1 | 130 |
| 3 | 2 | 260 |
| 4 | 3 | 390 |
| 5 | 5 | 650 |
| 6 | 10 | 1300 |
| 7 | 15 | 1950 |
| 8 | 20 | 2600 |

For more practice, see Lessons 1-7, 2-1, 2-2, 2-3, 2-4, 2-5, 2-6, 3-1, 3-3, INV 3, 3-4, 3-5, 3-6, 3-7, 4-1, 4-5, 5-2, 5-3, 5-4, INV 5, 5-5, 5-6, 5-7, 6-1, 6-2, 6-3, 6-4, INV 6, 6-5, 6-6, 7-1, 7-2, 7-3, 7-4, INV 7, 7-5, 7-6, 7-7, 8-7, INV 8, INV 10, 10-2, 10-3, 10-4, 10-5, 11-1, 11-2, 11-3, 11-4, 11-5, 11-6, 11-7, INV 11, 12-1, 12-2, 12-3, 12-4, 12-5, 12-6, 12-7, INV 12, 13-1, 13-2, 13-3, 13-4, 13-5, INV 13, 13-6, 13-7, and 14-2 in Algebra 1.



Name: _____

Date: _____

Standards Practice

Understanding Functions I.A.5.

Make judgments about units of measure and scales within a system and between systems.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1 Quandalyn types 45 words a minute. How many words can she type in an hour at the same rate? 1 **D**
A 450
B 900
C 2250
D 2700
E 4500
- 2 How many inches are there in a mile? 2 **E**
A 1760
B 5280
C 31,680
D 52,800
E 63,360
- 3 Sergio plans to paint a building with a surface area of about 300 square yards. The brand of paint he prefers has a label indicating that one gallon will cover about 400 square feet. How many gallons of paint will Sergio need? 3 **E**
A less than one gal
B 1.5 gal
C 2.5 gal
D 5 gal
E 6.75 gal
- 4 How many centimeters are there in 5.4 meters? 4 **C**
A 0.054
B 0.54
C 540
D 5400
E 54,000
- 5 Moriah has a bucket that holds one gallon of water. At Hilton Head beach, Moriah fills the bucket with sand and estimates the mass of the sand. What unit of measure should Moriah use to record the mass of the sand? 5 **A**
A kilograms
B pints
C hectares
D cubic feet
E liters



Name:

Date:

Standards Practice

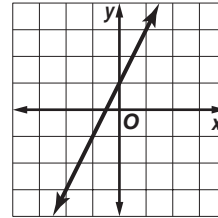
Understanding Functions I.B.1.

Identify and sketch the general forms of linear ($y = x$) and quadratic ($y = x^2$) parent functions.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

1 Which equation describes the graph?

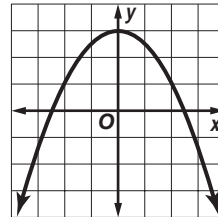
- A $y = x$
- B $y = x + 1$
- C $y = 2x + 1$
- D $y = -x$
- E $y = -x + 1$



1 **C**

2 The equation that best represents the graph is

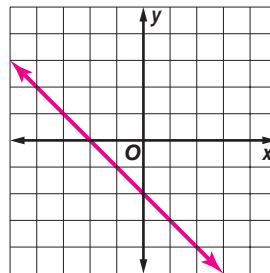
- A $y = 0.5x^2 + 3$.
- B $y = x^2 + 3$.
- C $y = 3x^2$.
- D $y = -0.5x^2 + 3$.
- E $y = -x^2 + 3$.



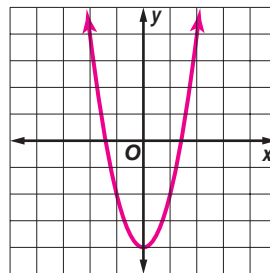
2 **D**

Read each question carefully and write your answer in the space provided. Be sure to show all your work.

3 Use the grid to sketch the graph of $y = -x - 2$. [3]



4 Use the grid to sketch the graph of $y = 2x^2 - 4$. [3]



For more practice, see Lessons 7-5, 7-6, 11-1, and 11-2 in Algebra 1.



Name: _____

Date: _____

Standards Practice

Understanding Functions I.B.2.

For a variety of situations, identify and determine reasonable domain and range values for given situations.

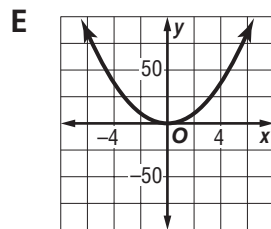
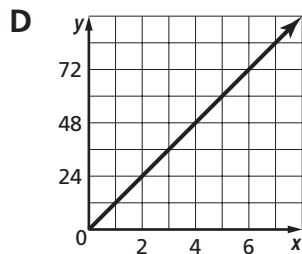
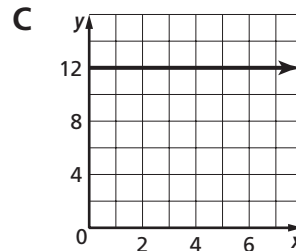
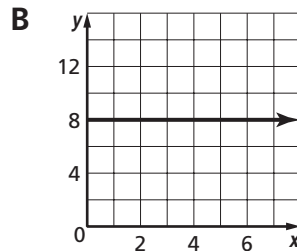
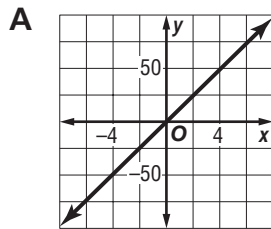
Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1 Shari makes a graph of the amount she earns in a day as a function of the number of hours she works. She is paid \$20 an hour. Which statement about Shari's graph is true?

1 **C**

- A The range is from \$0 to \$20.
 B The domain and range are both -20 to 20 .
 C The domain is from 0 to 12 .
 D The range is from \$20 to \$200.
 E The domain must include negative integers.

- 2 A marine biologist tags and measures 12 turtles each hour. Which graph represents the number of turtles tagged and measured in an 8-hour day?

2 **D** 

Read each question carefully and write your answer in the space provided. Be sure to show all your work.

- 3 Conrad graphs the total sales tax on a meal at Lewis' Surf and Turf as a function of the cost of the meal. What is a reasonable domain and range for Conrad's graph? [3]

Sample answer: $D = \{c | \$0 \leq c \leq \$100\}$; $R = \{t | \$0 \leq t \leq \$10\}$

For more practice, see Lessons 6-1, 6-2, 6-4, and 7-4 in Algebra 1.



Name: _____

Date: _____

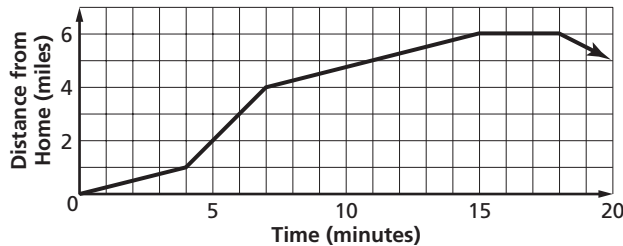
Standards Practice

Understanding Functions I.B.3.

Interpret situations in terms of given graphs or create situations that fit given graphs.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

The graph represents Kyle's bicycle ride from home. Use the graph to answer Questions 1–5.



- 1 What is Kyle's average speed for the first four minutes of his trip? 1 D
A 1 mi/h B 2 mi/h C 4 mi/h
D 15 mi/h E 20 mi/h
- 2 How many minutes after leaving home was Kyle bicycling the fastest? 2 B
A 4 min B 8 min C 11 min
D 15 min E 17 min
- 3 Which most likely describes what Kyle was doing from minutes 15 to 18? 3 E
A bicycling slowly uphill
B bicycling quickly downhill
C bicycling home at a steady pace on level ground
D driving home
E resting
- 4 What does Kyle most likely do at minute 18? 4 D
A eat a snack in a cafe
B talk to some friends on the sidewalk
C head home pushing his bicycle
D head for home on a bus with a bicycle rack
E continue to bicycle farther from home
- 5 What is the maximum distance Kyle is from home? 5 B
A 5 mi B 6 mi C 8 mi
D 15 mi E 20 mi



Name: _____

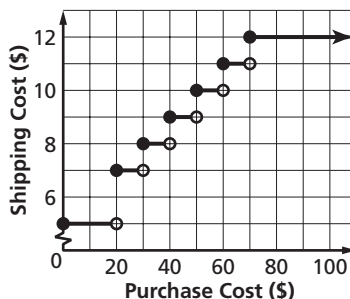
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Standards Practice

Understanding Functions I.B.3. (continued)

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

The graph represents the shipping costs for a mail-order toy store. Use the graph to answer Questions 6–9.



- 6 How much is the shipping cost for purchases totaling \$28?

A \$5
 B \$6
 C \$7
 D \$8
 E \$9

6 **C**

- 7 How much is the shipping cost for purchases totaling \$40?

A \$5
 B \$6
 C \$7
 D \$8
 E \$9

7 **E**

Read each question carefully and write your answer in the space provided. Be sure to show all your work.

- 8 Does the graph pass through the point at (60, 10)? What does the circle signify in terms of shipping cost? [3]

No; sample answer: A purchase costing \$50 or more but less than \$60 will cost \$10 to ship, but a purchase of \$60 will cost \$11 to ship.

- 9 What is the shipping cost as a percent of the purchase total for a purchase of \$15? for a purchase of \$100? [3]

**A shipping cost of \$5 is 33.3% of the purchase total of \$15.
 A shipping cost of \$12 is 12% of the purchase total of \$100.**

For more practice, see Lessons 6-3, 7-5, 7-6, 11-1, and 11-2 in Algebra 1.



Name: _____

Date: _____

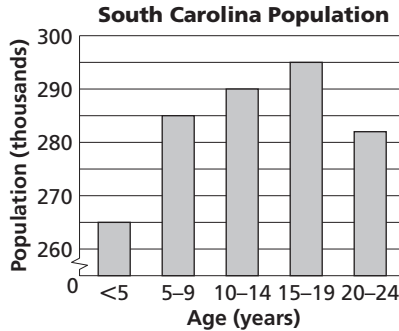
Standards Practice

Understanding Functions I.B.4.

Represent, display, and interpret data using scatterplots, bar graphs, stem-and-leaf plots, and box-and-whiskers diagrams, including representations on graphing calculators and computers.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

Use the graph to answer Questions 1 and 2.



- Which age range has the highest population?
 A under 5 yr
 B 5 to 9 yr
 C 10 to 14 yr
 D 15 to 19 yr
 E 20 to 24 yr

1 D

- What was the approximate total population of South Carolinians under 25 years old?
 A 265
 B 1410
 C 1,000,000
 D 1,400,000
 E 1,450,000

2 D

Teofolo recorded the daily high temperature in his yard every day for a month using a stem-and-leaf plot. Use the plot to answer Questions 3 and 4.

Daily High Temperature for April in °F

| Stem | Leaf |
|------|-----------------------|
| 5 | 2 5 5 6 6 |
| 6 | 3 5 5 5 5 6 7 7 7 8 8 |
| 7 | 2 2 4 5 7 8 9 9 |
| 8 | 1 1 2 3 8 8 |

$5|2 = 52$

- By how many degrees did the daily high fluctuate during April?
 A 3°
 B 7°
 C 30°
 D 32°
 E 36°

3 E

- What was the median daily high temperature for April?
 A 3°
 B 65°
 C 68°
 D 70°
 E 71°

4 C



Name: _____

Date: _____

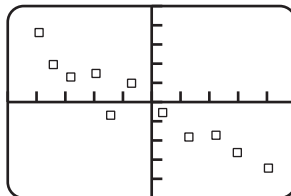
Standards Practice

Understanding Functions I.B.4. (continued)

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

5 Which is a true statement about the graph shown on this graphing calculator?

- A This is a box-and-whisker plot with a negative correlation.
- B This is a stem-and-leaf plot with a horizontal correlation.
- C This is a bar graph with no correlation.
- D This is a dot matrix plot with a positive correlation.
- E This is a scatter plot with a negative correlation.

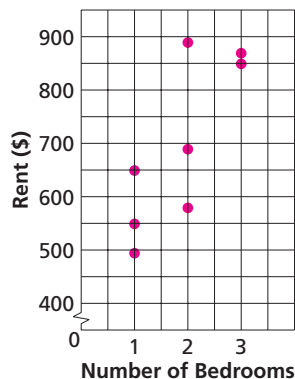


5 E

Read each question carefully and write your answer in the space provided. Be sure to show all your work.

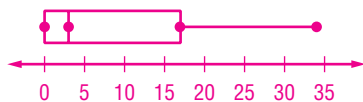
6 The table list prices for some apartments. Make a scatter plot of the data. [5]

| | | | | | | | | |
|---------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Number of Bedrooms | 2 | 1 | 2 | 1 | 3 | 1 | 3 | 2 |
| Monthly Rent | \$690 | \$495 | \$890 | \$550 | \$850 | \$650 | \$870 | \$580 |



7 Following is the record high total monthly snowfall, in inches, in South Carolina for each month of the year. Make a box-and-whisker plot of the data. [4]

21, 34, 18, 4, 2, 0, 0, 0, 0, 0, 16, 15



For more practice, see Lessons 1-6, 1-7, INV 5, 7-4, and INV 7 in Algebra 1.



Name: _____

Date: _____

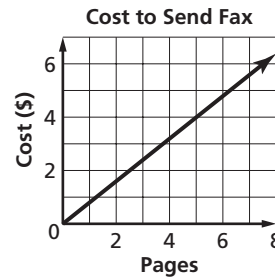
Standards Practice

Understanding Functions I.B.5.

Write a linear equation that fits a data set, check the model for “goodness of fit,” and make predictions using the model.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1 The graph models the amount charged by a hotel to send a fax within the United States. Based on the graph, how much would you expect to pay to fax a 10-page document?
- A \$8.00 B \$7.20
 C \$6.40 D \$4.80
 E \$0.80



1 **A**

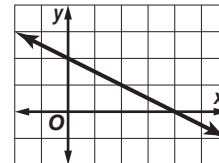
- 2 Which equation best fits the data in the table?

| | | | | | | |
|---|-----|-----|----|----|---|----|
| x | -2 | -1 | 0 | 1 | 2 | 3 |
| y | -20 | -14 | -8 | -2 | 4 | 10 |

- A $x = 6y + 8$ B $y = 6x - 8$ C $y = x - 18$
 D $y = 5x - 10$ E $y = -6x + 8$

2 **B**

- 3 For which data set would this graph be a line of best fit?



- A

| | | | | |
|---|----|---|---|---|
| x | -1 | 0 | 1 | 2 |
| y | 2 | 2 | 2 | 1 |

 B

| | | | | |
|---|----|---|-----|-----|
| x | -1 | 0 | 1 | 2 |
| y | 3 | 2 | 1.5 | 0.5 |
- C

| | | | | |
|---|----|-----|-----|-----|
| x | -1 | 0 | 1 | 2 |
| y | 3 | 2.5 | 1.5 | 1.3 |

 D

| | | | | |
|---|----|---|---|---|
| x | -1 | 0 | 1 | 2 |
| y | 2 | 1 | 1 | 1 |

3 **B**

Read each question carefully and write your answer in the space provided. Be sure to show all your work.

- 4 Three sacks of cracked corn will feed all of Lauren’s geese for a month. Write an equation to relate how many sacks of corn s are needed for m months. Using your equation, predict how many sacks Lauren will buy in a year. [3]

Sample answer: $s = 3m$; 36 sacks will be needed for a year.

For more practice, see Lesson INV 7 in Algebra 1.



Name: _____

Date: _____

Standards Practice

Understanding Functions I.C.1. (continued)

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

6 Write 0.00055 in scientific notation.

A 5.5×10^{-5}

B 5.5×10^{-4}

C 55×10^5

D 5.5×10^5

E 5.5×10^4

6 **B**

7 The radius of the Earth is about 6,378,000 meters. Write this number in scientific notation.

A 6.378×10^8

B 6.378×10^7

C 6.378×10^6

D 63.78×10^6

E 63.78×10^5

7 **C**

Read each question carefully and write your answer in the space provided. Be sure to show all your work.

8 Dinosaurs have been extinct for about 65 million years. Write this number in standard form and in scientific notation. [3]

65,000,000 or 6.5×10^7

9 One astronomical unit, AU, is rounded to ninety-three million miles and is about the distance from the Sun to Earth. Write this number in standard form and in scientific notation. [3]

93,000,000 or 9.3×10^7

10 Complete the table. [5]

| Standard Form | Scientific Notation |
|-----------------|-----------------------------------------|
| 0.000232 | 2.32×10^{-4} |
| 0.0875 | 8.75×10^{-2} |
| 0.11 | 1.1×10^{-1} |
| 12,500 | 1.25×10^4 |
| 620,000 | 6.2×10^5 |

For more practice, see Lesson 8-4 in Algebra 1.



Name: _____

Date: _____

Standards Practice

Understanding Functions I.C.2.

Use unit analysis to check measurement computations.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1 Autumn can walk 4.4 feet in a second. At the same rate, how many feet can she walk in an hour?

A 264
 B 1584
 C 2640
 D 15,840
 E 26,400

1 D

- 2 Alex estimates that his car's gas consumption is 35 miles per gallon. Which shows the correct expression he should use to convert the gas consumption to kilometers per liter?

A $\frac{35 \text{ mi}}{1 \text{ gal}} \cdot \frac{1 \text{ mi}}{1.6 \text{ km}} \cdot \frac{1 \text{ gal}}{3.8 \text{ L}}$
 B $\frac{35 \text{ mi}}{1 \text{ gal}} \cdot \frac{1.6 \text{ km}}{1 \text{ mi}} \cdot \frac{3.8 \text{ L}}{1 \text{ gal}}$
 C $\frac{35 \text{ mi}}{1 \text{ gal}} \cdot \frac{1 \text{ mi}}{1.6 \text{ km}} \cdot \frac{3.8 \text{ L}}{1 \text{ gal}}$
 D $\frac{1 \text{ gal}}{35 \text{ mi}} \cdot \frac{1 \text{ mi}}{1.6 \text{ km}} \cdot \frac{3.8 \text{ L}}{1 \text{ gal}}$
 E $\frac{35 \text{ mi}}{1 \text{ gal}} \cdot \frac{1.6 \text{ km}}{1 \text{ mi}} \cdot \frac{1 \text{ gal}}{3.8 \text{ L}}$

2 E

- 3 In one hour, Emalee's web site received 8 hits. At this rate, how many hits will Emalee's site receive in a week?

A 56 hits
 B 192 hits
 C 384 hits
 D 512 hits
 E 1344 hits

3 E

Read each question carefully and write your answer in the space provided. Be sure to show all your work.

- 4 A philosophy professor is paid \$40,000 per year and wants to determine how much he earns each minute. Using dimensional analysis, show the expression you would use to convert his annual salary to an amount per minute. Assume that there are 52 weeks in a year and 40 working hours in a week. Then simplify your expression to find his per minute pay rate. [3]

$$\frac{\$40,000}{1 \text{ yr}} \cdot \frac{1 \text{ yr}}{52 \text{ weeks}} \cdot \frac{1 \text{ week}}{40 \text{ h}} \cdot \frac{1 \text{ h}}{60 \text{ min}}; \$0.32 \text{ per minute}$$

For more practice, see Lesson 5-1 in Algebra 1.



Name: _____

Date: _____

Standards Practice

Understanding Functions I.C.3.

Given situations, determine patterns and represent generalizations algebraically.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1 The relationship between x and y is such that y is always 9 less than the value of x . Which function represents this relationship? 1 E
- A $9y = x$ B $y = 9x$ C $y = 9 - x$
D $y = 9 \div x$ E $y = x - 9$
- 2 Which best describes the rule for finding the next number in the pattern 13, 17, 19, 23, 29 ... ? 2 D
- A Write the next odd number.
B Add 4 to the previous number.
C Add 2 to the previous number.
D Write the next prime number.
E Write the next even number.
- 3 Happy Scales Snake-Sitting Service charges \$48 to board a pet snake for 4 days. They charge \$72 to board a snake for 6 days, and they charge \$120 to board a snake for 10 days. Which function represents the relationship between the number of days d that a snake is boarded and the cost of boarding c ? 3 B
- A $d = 12c$ B $c = 12d$ C $c = 12 + d$
D $c = 24d$ E $c = 48d$

Read each question carefully and write your answer in the space provided. Be sure to show all your work.

- 4 Four figures are shown. Write an equation that represents the relationship between the figure number f and the number of sides in the figure s . [2]



Figure 1



Figure 2

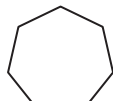


Figure 3

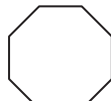


Figure 4

$$f = s - 4 \text{ or } s = f + 4$$

- 5 The relationship between a and b is such that a is always six times the value of b . Write an equation that represents this relationship. [2]

$$a = 6b$$

For more practice, see Lessons 7-4, 7-5, 8-2, and 11-7 in Algebra 1.



Name: _____

Date: _____

Standards Practice

Understanding Functions I.C.4.

Use symbolic representation, reasoning, and proof to verify statements about numbers.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1 Any number plus 7 is greater than the original number. How could you represent this statement symbolically? 1 **D**
- A $n + 7$
B $n > 7$
C $7 > n$
D $n + 7 > n$
E $n + 7 > 7$
- 2 Stephanie claims that all numbers divisible by a certain single-digit number end in that digit. Anthony disagrees with Stephanie's claim. What does Anthony have to do to disprove Stephanie's claim? 2 **B**
- A Test all multiples of the number.
B Find one counterexample.
C Prove the conjecture algebraically.
D Find at least three examples.
E Find at least three counterexamples.
- 3 Based on the rule that all numbers whose digits sum to a multiple of 3 are divisible by 3, which is true? 3 **E**
- A 61 is divisible by 3.
B 63 is divisible by 6.
C 65 is divisible by 9.
D 67 is divisible by 3.
E 69 is divisible by 3.

Read each question carefully and write your answer in the space provided. Be sure to show all your work.

- 4 A number added to its additive inverse equals zero. How could you represent this statement symbolically? [2]

Sample answer: $b + (-b) = 0$

For more practice, see Lessons 1-2, 1-3, and 1-4 in Algebra 1.



Name: _____

Date: _____

Standards Practice

Understanding Functions I.C.5.

Recognize and justify the relationship between the magnitude of a number and the application of specific operations.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1 Which would result in the greatest increase in the value of x if $x = 25$? 1 **A**
- A Dividing x by one half.
B Subtracting -7 from x .
C Multiplying x by $\frac{1}{5}$.
D Replacing x with its square root.
E Adding 10 to x .
- 2 Which statement is true? 2 **D**
- A The product of two integers with the same sign is always the sign of the two integers.
B The quotient of two negative integers is always negative.
C The sum of two negative integers is always positive.
D The quotient of two positive integers is always positive.
E The difference between two negative integers is always negative.
- 3 Which is the greatest value? 3 **A**
- A $\left(\frac{3}{2}\right)^2$ B 0.3^2 C $\left(\frac{1}{2}\right)^2$
D 0.1^2 E $\left(-\frac{1}{2}\right)^2$
- 4 Which operation is the opposite of division? 4 **E**
- A subtraction B squaring
C addition D finding square roots
E multiplication

Read each question carefully and write your answer in the space provided. Be sure to show all your work.

- 5 Write a counterexample to the statement: The square root of a number is always smaller than the original number. [3]

Sample answer: $\sqrt{\frac{1}{4}} = \frac{1}{2}$ and $\frac{1}{2}$ is greater than $\frac{1}{4}$.

For more practice, see Lesson INV 2 in Algebra 1.



Name: _____

Date: _____

Standards Practice

Understanding Functions I.C.6.

Identify and use properties related to operations with matrices (addition, subtraction, and scalar multiplication) to solve applied problems.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

For a class project, Rafaela and Shannon breed Great Carolina Wrens, the state bird of South Carolina, in two aviaries. The data in the matrices represent the number of adult and juvenile male and female wrens in each aviary. Use the data to answer Questions 1–3.

| | | Aviary 1 | | Aviary 2 | | | |
|----------|---|----------|--------|----------|--------|----|---|
| | | Male | Female | Male | Female | | |
| Adult | [| 12 | 15 | [| 10 | 12 |] |
| Juvenile | [| 5 | 6 | [| 2 | 2 |] |

1 Which matrix shows the total birds for both aviaries?

A $\begin{bmatrix} 22 & 27 \\ 7 & 8 \end{bmatrix}$

B $\begin{bmatrix} 22 & 7 \\ 27 & 8 \end{bmatrix}$

C $\begin{bmatrix} 22 & 25 \\ 7 & 8 \end{bmatrix}$

D $\begin{bmatrix} 27 & 12 \\ 11 & 14 \end{bmatrix}$

E $\begin{bmatrix} 27 & 22 \\ 11 & 4 \end{bmatrix}$

1 **A**

2 Which matrix shows the difference between the aviaries?

A $\begin{bmatrix} 2 & 3 \\ 4 & 3 \end{bmatrix}$

B $\begin{bmatrix} 2 & 3 \\ 3 & 4 \end{bmatrix}$

C $\begin{bmatrix} 2 & 13 \\ -1 & 4 \end{bmatrix}$

D $\begin{bmatrix} 3 & 2 \\ 1 & 0 \end{bmatrix}$

E $\begin{bmatrix} 3 & 2 \\ 3 & 4 \end{bmatrix}$

2 **B**

3 If the population in Aviary 1 doubles, which matrix operation could be used to represent this?

- A matrix squaring
- B scalar multiplication
- C matrix subtraction
- D matrix addition
- E scalar doubling

3 **B**



Name: _____

Date: _____

Standards Practice

Understanding Functions I.C.6. (continued)

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

A swing dance club has a two-day fundraiser for the Audubon Newhall Preserve in Hilton Head. The data in the matrices represent the number of members and guests who attended each of the swing dances. Use the data to answer Questions 4–6.

| Friday Dance | | | Saturday Dance | | |
|--------------|------|--------|----------------|------|--------|
| | Male | Female | | Male | Female |
| Members | 74 | 56 | Members | 86 | 64 |
| Guests | 32 | 28 | Guests | 38 | 32 |

4 Which matrix shows the total attendance for both nights?

4 **A**

A $\begin{bmatrix} 160 & 120 \\ 70 & 60 \end{bmatrix}$

B $\begin{bmatrix} 160 & 120 \\ 60 & 50 \end{bmatrix}$

C $\begin{bmatrix} 150 & 110 \\ 70 & 60 \end{bmatrix}$

D $\begin{bmatrix} 130 & 150 \\ 60 & 70 \end{bmatrix}$

E $\begin{bmatrix} 106 & 84 \\ 124 & 96 \end{bmatrix}$

5 Which matrix shows the increase in Saturday attendance over Friday?

5 **C**

A $\begin{bmatrix} 160 & 120 \\ 70 & 60 \end{bmatrix}$

B $\begin{bmatrix} 42 & 8 \\ 28 & 32 \end{bmatrix}$

C $\begin{bmatrix} 12 & 8 \\ 6 & 4 \end{bmatrix}$

D $\begin{bmatrix} -12 & 8 \\ -6 & 4 \end{bmatrix}$

Read each question carefully and write your answer in the space provided. Be sure to show all your work.

6 On Friday, members paid \$10 admission and guests paid \$12. Write the matrix that represents the total admission received on Friday. [4]

$\begin{bmatrix} 740 & 560 \\ 384 & 336 \end{bmatrix}$

For more practice, see Lessons INV 2 and INV 13 in Algebra 1.



Name: _____

Date: _____

Standards Practice

Understanding Functions I.D.1.

Find specific function values and evaluate expressions.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1 If $f(x) = -5x + 2$, then $f(-1)$ is 1 **E**
A -3 . B $-\frac{1}{5}$.
C $\frac{3}{5}$. D 3 .
E 7 .
- 2 What is the value of $f(x) = x^2 + x - 2$ for $f(3)$? 2 **B**
A 16 B 10
C 8 D 5
E 1
- 3 If $x = 4$, then $-2x^2 - 7$ is 3 **D**
A 57 . B 25 .
C -18 . D -39 .
E -71 .
- 4 What is the value of $3a + 12 \div b^2$ if $a = -3$ and $b = 2$? 4 **A**
A -6 B -3
C $\frac{3}{4}$ D $1\frac{1}{3}$
E 12

Read each question carefully and write your answer in the space provided. Be sure to show all your work.

- 5 If the length of a rectangle is $2x + 1$ and the width is x , what is the perimeter of the rectangle when $x = 6$ centimeters? Show the steps you used to determine your answer. [3]

38 cm; Sample steps:

$$\begin{aligned} P &= 2(\ell + w) && \text{Formula for perimeter} \\ &= 2(13 + 6) && \ell = 2(6) + 1 \text{ or } 13 \text{ and } w = 6 \\ &= 2(19) \\ &= 38 \end{aligned}$$

For more practice, see Lessons 1-2, 1-3, 1-4, 2-1, 2-4, 2-5, 2-6, 3-2, 8-1, and 8-3 in Algebra 1.



Name: _____

Date: _____

Standards Practice

Understanding Functions I.D.2.

Simplify polynomial expressions and perform polynomial arithmetic.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1 Which polynomial expression is $4a(a - 3) + 5a$ in simplest form? 1 D
- A $4a^2 + 5a - 12$
B $4a^2 - 12a + 5a$
C $4a^2 - 7a - 12$
D $4a^2 - 7a$
E $4a^2 - 12$
- 2 When you simplify $-2x^2(x^3 + 4x - 5) - 3x^2 + 1$, the polynomial that results is 2 E
- A $-2x^6 - 8x^2 + 10x^2 - 3x^2 + 1$.
B $-2x^6 - x^2 + 1$.
C $-2x^5 - 8x^3 + 10x^2 - 3x^2 - 1$.
D $-2x^5 - 8x^3 - 13x^2 - 1$.
E $-2x^5 - 8x^3 + 7x^2 + 1$.
- 3 Which expression is the sum of $(3c^2 + 8c - 2) + (c^3 - 12c^2 + 5)$? 3 C
- A $4c^2 - 4c + 3$
B $4c^5 - 4c^3 + 3$
C $c^3 - 9c^2 + 8c + 3$
D $c^3 - 9c^2 + 3$
E $c^3 - 9c^2 - 8c + 3$
- 4 If you calculate $(7y^2 - 5y + 11) - (9y^2 - 2y - 4)$, the difference is 4 A
- A $-2y^2 - 3y + 15$.
B $-2y^2 - 7y + 7$.
C $-2y^2 + 7y + 15$.
D $2y^2 - 7y + 7$.
E $2y^2 - 3y + 15$.
- 5 Which expression is the product of $3xy$ and $(-3x^2 + 2x - y)$? 5 B
- A $-9x^2y + 6xy - 3xy$
B $-9x^3y + 6x^2y - 3xy^2$
C $-9xy + 6y - 3x$
D $-9x^3 + 6x^2 - 3y^2$
E $-9x + 3$



Name: _____

Date: _____

Standards Practice

Understanding Functions I.D.2. (continued)

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 6 What is the product when you multiply $(x - 6)$ and $(x + 1)$? 6 D
 A $2x^2 - 5x - 6$ B $2x^2 - 5$
 C $2x - 5$ D $x^2 - 5x - 6$
 E $x^2 - 6$
- 7 Which polynomial is equivalent to $(4d + 3)^2$? 7 E
 A $8d + 6$ B $8d^2 + 9$
 C $16d^2 + 9$ D $16d^2 + 12d + 9$
 E $16d^2 + 24d + 9$
- 8 What is the quotient when you divide $24a^3b - 18a^2b + 6ab^2$ by $-6ab$? 8 C
 A $4a^2 + 3a - b$ B $4a^2 + 3ab - 1$
 C $-4a^2 + 3a - b$ D $-4a^2 - 3a - b$
 E $-4a^2 - 3a - 1$

Read each question carefully and write your answer in the space provided. Be sure to show all your work.

- 9 Simplify $2(6d^2 - 4d + 5) - d(5d - 4)$. Provide an explanation of the steps you used to arrive at your answer. [3]

$7d^2 - 4d + 10$; Sample answer:

Multiply $2(6d^2 - 4d + 5)$ and $-d(5d - 4)$, then add the results.

$2(6d^2 - 4d + 5)$ is $12d^2 - 8d + 10$ and $-d(5d - 4)$ is $-5d^2 + 4d$.

$$\begin{array}{r} 12d^2 - 8d + 10 \\ (+) -5d^2 + 4d \\ \hline 7d^2 - 4d + 10 \end{array}$$

- 10 What polynomial must be added to $9y^3 + 6y^2 - 2y + 4$ to get $6y^3 + y^2 - 3$? Explain how you solved the problem and justify your answer. [3]

$-3y^3 - 5y^2 + 2y - 7$; Sample answer: I subtracted $9y^3 + 6y^2 - 2y + 4$ from $6y^3 + y^2 - 3$ to get the answer. To justify the answer, add $-3y^3 - 5y^2 + 2y - 7$ and $9y^3 + 6y^2 - 2y + 4$ to get $6y^3 + y^2 - 3$.

For more practice, see Lessons 9-2, 9-3, 9-4, 9-5, 10-2, 15-1, 15-2, 15-3, 15-4, and 15-5 in Algebra 1.



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Standards Practice

Understanding Functions I.D.3.

Transform and solve equations and inequalities, factoring as necessary in problem situations.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

1 What is the value of x for $3x + 4 = -2$?

A -2

B $-\frac{3}{2}$

C $-\frac{2}{3}$

D $\frac{2}{3}$

E 2

1 **A**

2 Dekentra sells boxes of note cards imprinted with her sketches of bird life along the South Carolina coast. If it costs \$625 to produce 75 boxes of cards and she wants to earn a profit of at least \$2,000, what should she charge per box?

A \$18 or more

B more than \$18

C less than \$35

D \$35 or less

E \$35 or more

2 **E**

3 What is the value of x for $-2x + 11 \leq 27$?

A $x \leq -8$

B $x \geq -8$

C $x \leq -16$

D $x \leq -19$

E $x \geq -19$

3 **B**

Read each question carefully and write your answer in the space provided. Be sure to show all your work.

4 Enrique and his friends rented a boat to cruise some islands near Charleston. The marina charges a base rental fee of \$325 plus \$55 per hour. How many hours did they rent the boat if they paid a total fee of \$490? Include an equation in your answer. [3]

3 hr; $325 + 55x = 490$

5 What are the dimensions of a garden plot if the width is w , the length is $w + 3$, and the area is 54 square feet? Summarize the steps you used to solve the problem. [4]

width = 6 ft, length = 9 ft; Sample answer: Since the formula for area is length \times width, I used $w(w + 3) = 54$. I rewrote $w^2 + 3w = 54$ equal to zero. I factored the equation as $(w + 9)(w - 6)$ and set each factor to zero. Solutions are -9 and 6 , but since width cannot be -9 , the width is 6 and the length is $6 + 3$ or 9 .

For more practice, see Lessons 3-5, 3-6, 3-7, 4-4, 4-5, 4-6, 4-7, 5-1, 5-2, 5-3, 5-4, 5-5, 6-5, 6-6, 8-7, 11-3, 11-4, 11-5, 11-6, 11-7, 12-1, 12-2, 12-3, 12-4, 12-5, 12-6, 12-7, 13-1, 13-2, 13-3, 13-4, 13-5, 13-6, 13-7, 14-5, and 15-6 in Algebra 1.



Name: _____

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Standards Practice

Understanding Functions I.D.4.

Given a problem situation, determine whether to use a rough estimate, an approximation, or an exact answer. Select a suitable method of computing from techniques such as the use of mental mathematics, paper-and-pencil combinations, calculators, and computers.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1 Mr. Ekeledo plans to fence 24 acres he purchased for a horse farm in the Piedmont area. The property has 5 sides and he knows the exact measure of each side. Which method should he use to determine the amount of fencing he needs for his farm? 1 **B**
- A** Use mental math to figure a rough estimate of the perimeter, rounded to the nearest mile.
- B** Use paper and pencil to determine an approximation of the perimeter, rounded up to the nearest foot.
- C** Use a calculator to find the exact measure of the perimeter to the nearest quarter inch.
- 2 Anya thinks her history teacher made an error in calculating her semester grade. Which strategy should she use to show the teacher that the actual grade for 10 quizzes and 3 tests should be higher? 2 **C**
- A** Use a rough estimate of the average score on quizzes and tests to show that the teacher's calculations must be incorrect.
- B** Use paper and pencil to show that approximate averages on quizzes and tests are higher than calculated averages.
- C** Use a calculator to show the exact mean of quizzes and tests to the nearest tenth.
- D** Use a spreadsheet to calculate quiz and test averages to the nearest thousandth.
- 3 The editor for the school newspaper tells you to include attendance figures in your article for the upcoming football game. When you attend the game you 3 **A**
- A** make a rough estimate by counting the number of people per bench and then mentally multiplying an average number of people per bench times the number of filled benches.
- B** round the number of people on each bench to the nearest ten and then use paper and pencil to add the figures to make an approximation.
- C** count the exact number of people on each bench and use your calculator to add each bench count to get an exact total.



Name: _____

Date: _____

Standards Practice

Understanding Functions I.D.4. (continued)

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 4 A student committee is in the first stages of planning the annual school dance. They need to determine how much to spend on refreshments, security, music, decorations, and printing for tickets and advertisements. Other items to consider are the number of students most likely to attend and income from fund-raising events. At this first stage, the *best* choice for the committee would be to
- A use mental math to get a rough estimate of expenses and income so they can plan for fund-raising events.
 - B use paper and pencil to figure approximate expenses and income so they can start purchasing items for the dance.
 - C use a calculator to compute exact costs of expenses and income so they can hire security or a band.
 - D use a spreadsheet to determine exact costs to make it easier to compute changes in expenses or income.

4 **A**

Read each question carefully and write your answer in the space provided. Be sure to show all your work.

- 5 Joaquin manages a dive shop in Myrtle Beach. He believes that the owner could triple business if she offered more chartered crews and more scuba lessons. Determine whether Joaquin should use a rough estimate, an approximation, or exact numbers to convince the owner that profits would exceed costs if she expanded her business. Choose the method he should use to compute numbers. Explain. [5]

Sample answer: Joaquin should use exact numbers to convince the owner to expand her business. The best method for computing numbers would be to use spreadsheets. He could use spreadsheets to calculate and show the exact cost of hiring various numbers of employees, the exact numbers of clients they would need to turn a profit, and the exact revenue that would be generated from expanded services. The projected income is approximate, but it is based on exact numbers. Since he would be using spreadsheets, he could easily manipulate the numbers to show the potential profit depending on factors such as different levels of expanded services and employee salaries.

For more practice, see Lesson 1-5 in Algebra 1.



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Standards Practice

Linear Functions II.A.1.

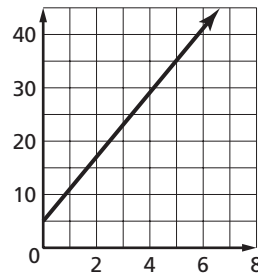
Determine whether or not given situations can be represented by linear functions.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1 Which situation can be represented by a linear function?
- A The distance traveled by a roller coaster that accelerates to 80 miles per hour in 1.8 seconds.
 - B The cost of dance lessons at \$9 per hour.
 - C The mass of a 500-gram radioactive isotope with a half-life of 10 days.
 - D The balance of a savings account compounded daily at 4%.

1 **B**

- 2 The linear function shown could represent the
- A increase in value of a \$5 baseball card at 6% per year.
 - B weekly attendance at a movie (in thousands) starting at 5000.
 - C height of a toy rocket launched 5 feet from the ground.
 - D cost of admission to a park and canoe rental at \$6 per hour.

2 **D**

- 3 Which situation *cannot* be represented by a linear function?
- A The cost to make photocopies at 7 cents per copy.
 - B The distance traveled at 50 miles per hour.
 - C The value of a car that depreciates 15% per year.
 - D The gallons of water used in a shower when a shower head has a flow rate of 1.9 gallons per minute.

3 **C**

Read each question carefully and write your answer in the space provided. Be sure to show all your work.

- 4 Rikki-Jo designs custom jewelry made from seashells. Her fee includes an initial charge of \$50 plus \$15 per hour. Explain whether this situation can be represented by a linear function. [3]

Yes; sample answer: If a quantity changes at a constant rate over time, it can be represented by a linear function. In this situation, the starting point is the \$50 initial fee and the constant rate is \$15 times the hours it takes to make the jewelry.

For more practice, see Lesson 6-2 in Algebra 1.



Name: _____

Date: _____

Standards Practice

Linear Functions II.A.2.

Based on the constraints of the problem, determine the domain and range values for linear functions.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1 What is the domain of the function shown in the table at the right?

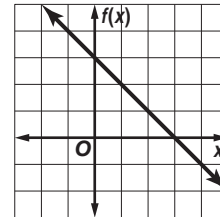
- A $\{-5, -1, 1, 3, 5\}$
 B $\{-2, 0, 1, 2, 3\}$
 C $\{-5, -2, -1, 0, 1, 2, 3, 5\}$
 D $\{(-2, -5), (0, -1), (1, 1), (2, 3), (3, 5)\}$
 E $\{(-5, -2), (-1, 0), (1, 1), (3, 2), (5, 3)\}$

| x | y |
|----|----|
| -2 | -5 |
| 0 | -1 |
| 1 | 1 |
| 2 | 3 |
| 3 | 5 |

1 **B**

- 2 What is the range of the function shown on the graph when $D = \{0, 1, 3\}$?

- A $\{(0, 3), (1, 2), (3, 0)\}$
 B $\{0, 1, 2\}$
 C $\{3\}$
 D $\{3, 1, 0\}$
 E $\{3, 2, 0\}$

2 **E**

- 3 What is the range of $f(x) = 8x - 5$ for $D = \{-2, -1, 3\}$?

- A $\{-21, -13, 19\}$
 B $\{-1, -\frac{3}{4}, -\frac{1}{4}\}$
 C $\{-\frac{3}{8}, \frac{1}{2}, 1\}$
 D $\{5\}$
 E $\{11, 3, 19\}$

3 **A**

- 4 In Question 3, when a range value is 11, the corresponding domain value is

- A 83.
 B 6.
 C 2.
 D $\frac{3}{4}$.
 E -2.

4 **C**

Read each question carefully and write your answer in the space provided. Be sure to show all your work.

- 5 Give the domain and range of the function shown in the table. [2]

- D = $\{-3, -1, 2, 3\}$**
R = $\{17, 7, -8, -13\}$

| x | y |
|----|-----|
| -3 | 17 |
| -1 | 7 |
| 2 | -8 |
| 3 | -13 |

For more practice, see Lessons 6-1, 6-2, 6-4, and 7-4 in Algebra 1.



Name: _____

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Standards Practice

Linear Functions II.A.3. (continued)

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 4 In 2000, Louise the python was 10 feet long. Louise's owner estimates that she grows a half inch each year. Which equation represents Louise's length ℓ as a function of years since 2000 y ?

A $\ell = \frac{1}{2}y$

B $\ell = 10 + \frac{1}{2}y$

C $\ell = 10 + \frac{1}{24}y$

D $\ell = 0.5(10 + y)$

E $\ell = 10y + \frac{1}{2}$

4 **C**

- 5 Which table corresponds to $d = -7g + 2$?

A

| | | | | |
|----------|-----|----|----|----|
| g | -2 | -1 | 0 | 1 |
| d | -16 | -9 | -2 | -5 |

B

| | | | | |
|----------|-----|----|---|----|
| g | -2 | -1 | 0 | 1 |
| d | -12 | 9 | 2 | -5 |

C

| | | | | |
|----------|-----|----|----|---|
| g | -2 | -1 | 0 | 1 |
| d | -16 | -9 | -2 | 5 |

D

| | | | | |
|----------|----|----|---|---|
| g | -2 | -1 | 0 | 1 |
| d | 12 | 9 | 2 | 9 |

E

| | | | | |
|----------|----|----|---|----|
| g | -2 | -1 | 0 | 1 |
| d | 16 | 9 | 2 | -5 |

5 **E**

Read each question carefully and write your answer in the space provided. Be sure to show all your work.

- 6 Complete the table for $y = 6x + 5$. [3]

| | | | | | | |
|----------|----|----|----------|-----------|-----------|-----------|
| x | -2 | -1 | 0 | 1 | 2 | 3 |
| y | -7 | -1 | 5 | 11 | 17 | 23 |

- 7 The table shows the relationship between the number of customers c waiting in line and the number of available cashiers a . Describe the relationship in words. [3]

| | | | | |
|----------|---|----|----|----|
| c | 5 | 10 | 15 | 20 |
| a | 2 | 4 | 6 | 8 |

Sample answer: There is one cashier assigned for every 2.5 customers.

For more practice, see Lessons INV 3, 6-1, 6-2, 6-3, 6-4, INV 6, 6-5, 7-2, 7-3, 7-4, INV 7, 7-5, 7-6, and 7-7 in Algebra 1.



Name: _____

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Standards Practice

Linear Functions II.B.1.

Develop the concept of slope as rate of change and determine slope from graphs, tables, and algebraic representations.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

1 What is the slope of this graph?

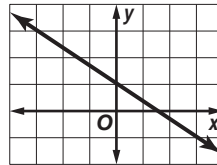
A -2

B $-\frac{3}{2}$

C $-\frac{2}{3}$

D $\frac{2}{3}$

E $\frac{3}{2}$



1 **C**

2 What is the slope of the graph corresponding to the function in this table?

A 5

B 4

C 3

D -1

E -4

| | | | | | | |
|---|----|----|---|---|----|----|
| x | -2 | -1 | 0 | 1 | 2 | 3 |
| y | -5 | -1 | 3 | 7 | 11 | 15 |

2 **B**

3 What is the slope of the graph of $y = -\frac{7}{3}x + 2$?

A $-\frac{7}{3}$

B -2

C $\frac{1}{3}$

D 2

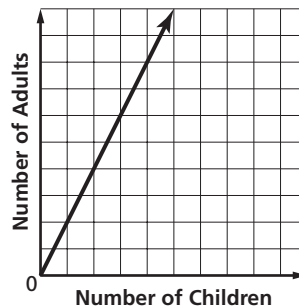
E $\frac{7}{3}$

3 **A**

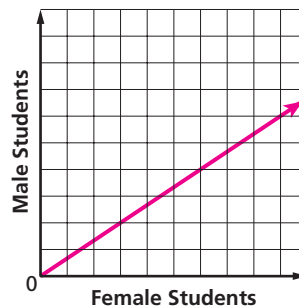
Read each question carefully and write your answer in the space provided. Be sure to show all your work.

4 The graph shows the number of adults and children who participated in a nature walk at Huntington Beach State Park. What is the slope of the graph? What does the slope of the graph tell about the ratio of adults to children? [4]

The slope is 2. Sample answer: There are twice as many adults as there are children.



5 At a baking class offered at a community college, there are 3 female students for every 2 male students. Complete the graph representing the class. [3]



For more practice, see Lessons 7-1, 7-2, 7-3, and 7-6 in Algebra 1.



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Standards Practice

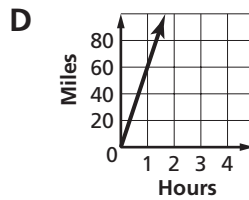
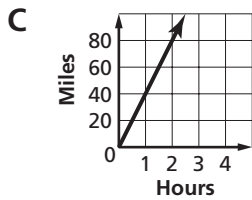
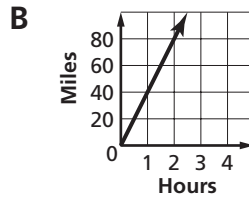
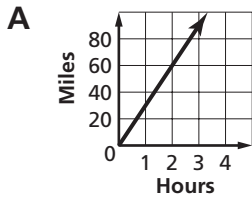
Linear Functions II.B.2.

Interpret the meaning of slope and intercepts in situations using data, symbolic representations, or graphs.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

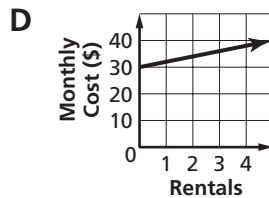
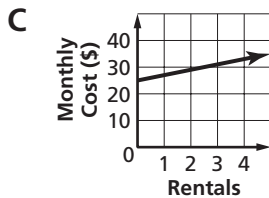
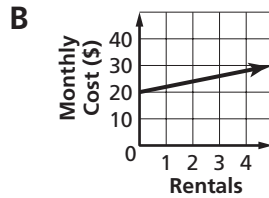
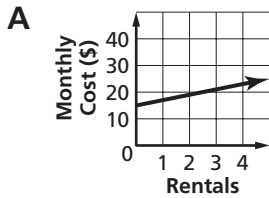
1 The graphs show the rates of speed of four cars. Which car is fastest?

1 D



2 The graphs show the cost of four movie rental programs. For each program, there is a minimum monthly fee plus a rental charge for each movie rented. Which graph shows a minimum monthly fee of \$15?

2 A



Read each question carefully and write your answer in the space provided. Be sure to show all your work.

3 A graph with distance marked on the vertical axis and time marked on the horizontal axis has a slope of 0. What does this graph represent in terms of a real-world scenario? [3]

Sample answer: The distance is not changing regardless of time elapsed.

For more practice, see Lessons 7-1, 7-2, 7-3, and 7-6 in Algebra 1.



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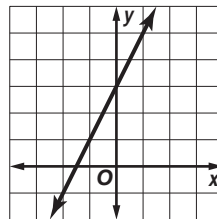
Standards Practice

Linear Functions II.B.3.

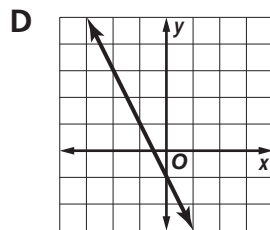
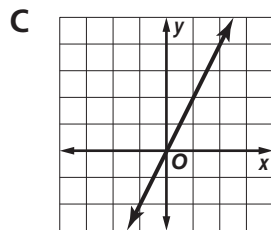
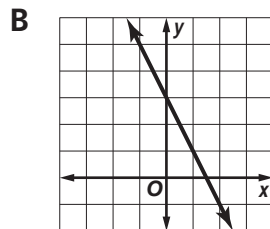
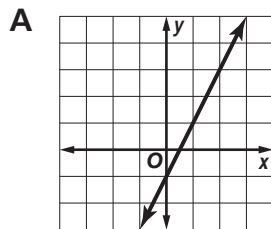
With and without using a graphing calculator, investigate, describe, and predict the effects of changes in m and b on the graph of $y = mx + b$.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

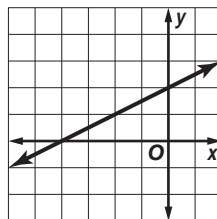
- 1 To the right is the graph of $y = mx + 3$. Which of these is the graph of $y = mx - 1$?



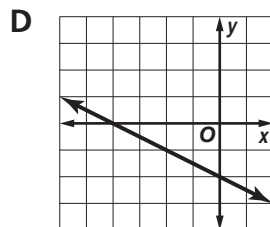
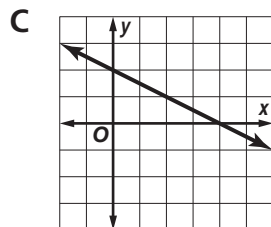
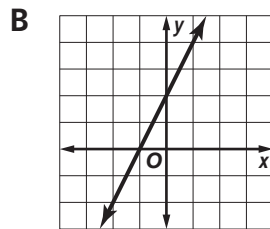
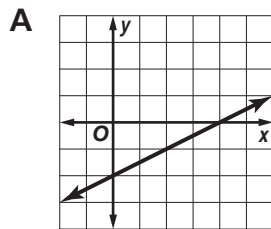
1 **A**



- 2 To the right is the graph of $y = mx + 2$. Which of these is the graph of $y = -mx + 2$?



2 **C**





Name: _____

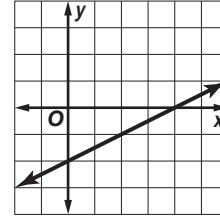
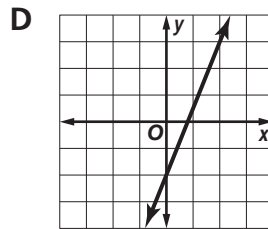
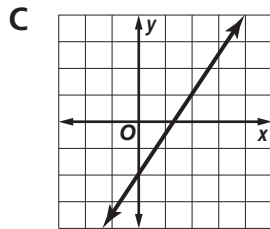
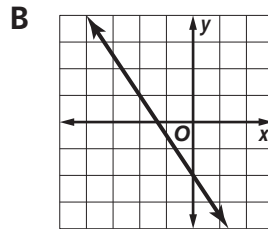
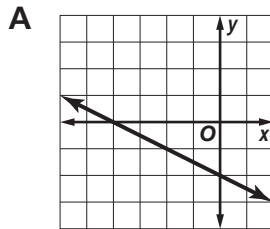
Date: _____

Standards Practice

Linear Functions II.B.3. (continued)

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 3 To the right is the graph of $y = \frac{1}{2}x + b$. Which of these is the graph of $y = \frac{3}{2}x + b$?

3 **C** 

- 4 Which best describes the difference between the graphs of $f(x) = 17x - 2$ and $g(x) = 18x - 2$ on a graphing calculator?
- A The graphs have the same slope, but different x -intercepts.
 - B The graphs have the same slope, but different y -intercepts.
 - C The graphs have different slopes, but the same x -intercept.
 - D The graphs have different slopes and opposite y -intercepts.
 - E The graphs have different slopes, but the same y -intercept.

4 **E**

Read each question carefully and write your answer in the space provided. Be sure to show all your work.

- 5 Describe in words how the graph of $f(x) = 8x + 3$ is similar to and different from the graph of $g(x) = 8x + 4$. [3]

Sample answer: The graphs are similar in that they have the same slope of 8. The graphs are different in that f intercepts the y -axis at 3 and g intercepts the y -axis at 4.

For more practice, see Lesson 7-6 in Algebra 1.



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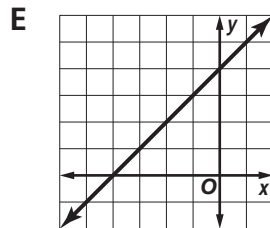
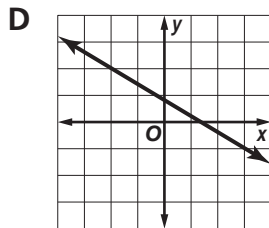
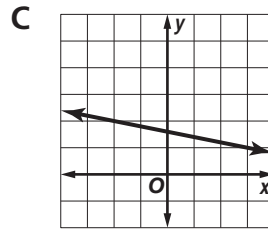
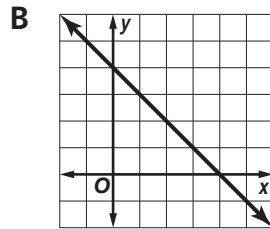
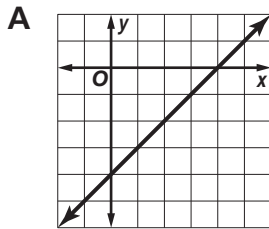
Standards Practice

Linear Functions II.B.4.

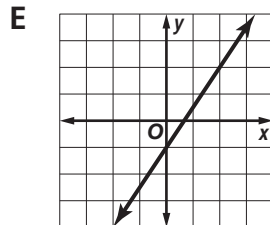
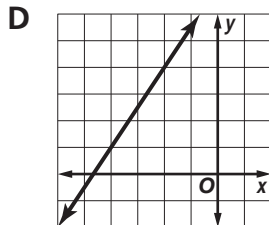
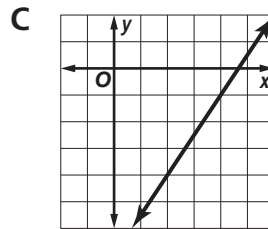
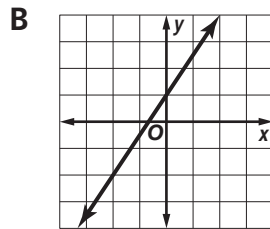
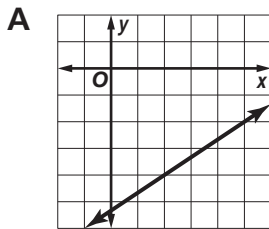
Graph and write equations of lines given characteristics such as two points, a point and a slope, or a slope and y -intercept.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1 Which of these is the graph of the line passing through $(-2, 2)$ and $(3, -1)$?

1 **D** 

- 2 Which of these is the graph of the line passing through $(-2, -4)$ with slope $\frac{3}{2}$?

2 **E** 



Name: _____

Date: _____

Standards Practice

Linear Functions II.B.4. (continued)

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 3 Which of these is the equation of the line with y -intercept -7 and slope 3 ?

A $y = 3x - 7$
B $y = -7x + 3$
C $3y = -7x$
D $-7y = 3x$
E $-7y = 3x + 1$

3 **A**

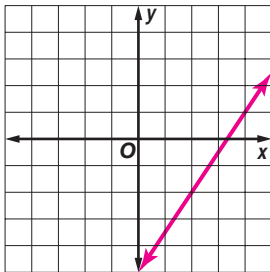
- 4 Which of these is the equation of the line with slope $\frac{3}{2}$ passing through $(0, 3)$?

A $y = \frac{3}{2}x + 0.3$
B $y = \frac{3}{2}x + 1$
C $2y = 3x + 6$
D $y = 6x + \frac{3}{2}$
E $y = x + \frac{3}{2}$

4 **C**

Read each question carefully and write your answer in the space provided. Be sure to show all your work.

- 5 Graph the line with slope $\frac{3}{2}$ passing through $(4, 1)$. [4]



- 6 Write the equation of the line passing through $(2, 3)$ and $(-1, 1)$. [3]

$$y = \frac{2}{3}x + \frac{5}{3} \text{ or } 3y = 2x + 5$$

For more practice, see Lessons 7-2, 7-3, 7-5, and 7-6 in Algebra 1.



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Standards Practice

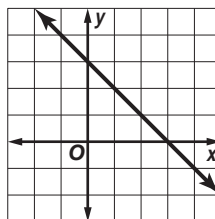
Linear Functions II.B.5.

Determine the intercepts of linear functions from graphs, tables, and algebraic representations.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

1 Which are the intercepts of the function graphed?

- A (3, 0), (0, 0)
- B (0, 3), (3, 0)
- C (0, 3), (0, 0)
- D (0, 0), (3, 3)
- E (0, -3), (3, 0)



1 **B**

2 Which are the intercepts of the function in the table?

| | | | | | | |
|---|-----|-----|----|---|---|----|
| x | -2 | -1 | 1 | 2 | 3 | 4 |
| y | -20 | -15 | -5 | 0 | 5 | 10 |

- A (2, 0)
- B (0, -10), (0, 2)
- C (0, 10), (2, 0)
- D (-10, 0), (0, 2)
- E (0, -10), (2, 0)

2 **E**

3 Which are the intercepts of $y = 12x - 3$?

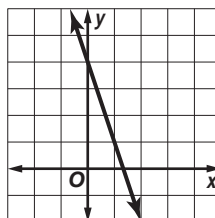
- A (12, -3)
- B (1, 12), (1, -3)
- C (0, 3), $(-\frac{1}{4}, 0)$
- D (0, -3), $(\frac{1}{4}, 0)$
- E (0, -3), (4, 0)

3 **D**

Read each question carefully and write your answer in the space provided. Be sure to show all your work.

4 Determine the intercepts of the function graphed. [3]

$(0, 4), (\frac{4}{3}, 0)$



5 Determine the intercepts of $y = -7x + 1$. [3]

$(0, 1), (\frac{1}{7}, 0)$

For more practice, see Lesson 7-3 in Algebra 1.



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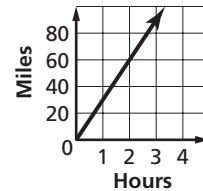
Standards Practice

Linear Functions II.B.6.

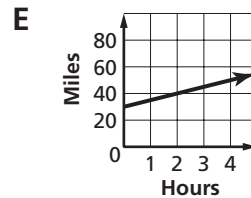
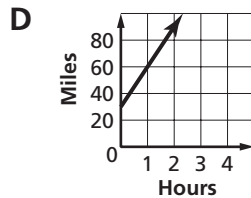
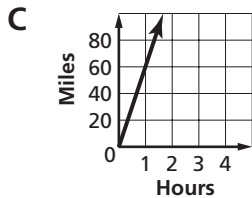
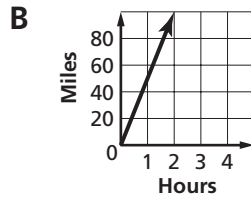
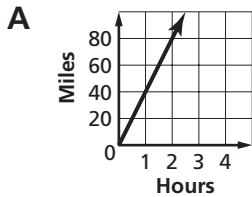
With and without using a graphing calculator, interpret and predict the effects of changing slope and y -intercept in applied situations.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

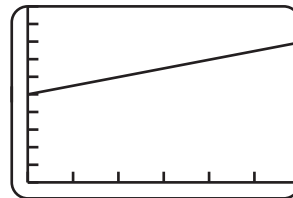
- 1 The graph shows a speed of 30 miles per hour. Which of these is the graph adjusted to show a speed of 40 miles per hour?



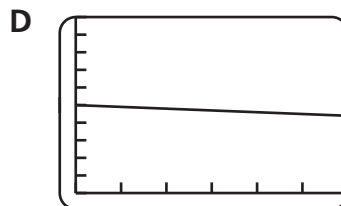
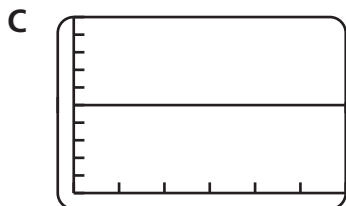
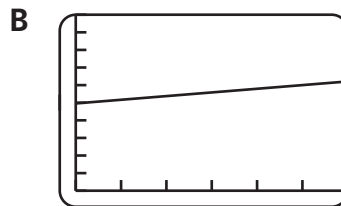
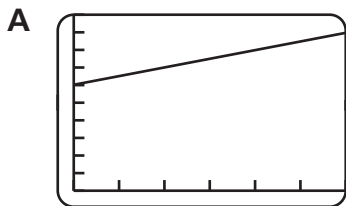
1 **A**



- 2 The graph on the graphing calculator shows how much Melissa's Mopeds in Myrtle Beach charges to rent mopeds. Melissa's Mopeds charges an upfront fee of \$50 and an hourly rate of \$5. Which of these results when Melissa's Mopeds changes their upfront fee to \$60?



2 **A**





Name: _____

Date: _____

Standards Practice

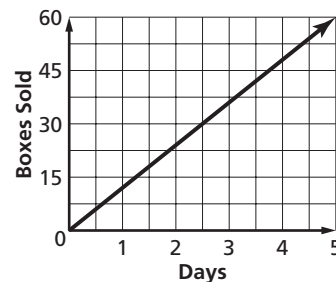
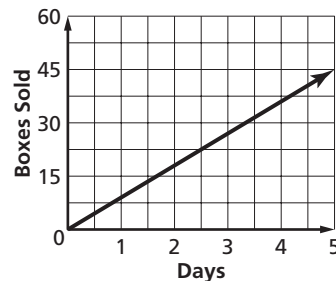
Linear Functions II.B.6. (continued)

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 3 A quality inspector at a manufacturing plant reviews a graph reporting that one machine in the plant produces 33 parts per minute. The quality inspector adjusts the machine so it produces 28 parts per minute. How will the graph representing the machine's performance change as a result?
- A The y -intercept of the graph will change from $(0, 33)$ to $(0, 28)$.
 B The x -intercept of the graph will change from $(33, 0)$ to $(28, 0)$.
 C The graph will shift upward 5 units.
 D The graph will shift downward 5 units.
 E The slope of the graph will change from 33 to 28.

3 E

- 4 At the beginning of the yearly cookie sale, a troop of Girl Scouts makes the top graph showing the average number of cookie boxes they sell each day. After two weeks, their graph looks like the bottom graph. What has changed?



- A They have raised the price of each box of cookies by \$3.
 B They are selling 2 fewer boxes each day.
 C They are selling 3 more boxes each day.
 D Several girl scouts have left the troop.
 E Several girl scouts have joined the troop.

4 C

Read each question carefully and write your answer in the space provided. Be sure to show all your work.

- 5 A house-cleaning service charges \$85 to clean four rooms and \$15 for each additional room. They make a graph to show their charges for one to ten rooms. If they decide to offer a special of \$10 for each additional room, describe in words how their graph will change and how it will remain the same. [4]

The slope of the graph will change from 15 to 10. The y -intercept of the graph will remain at \$85.

For more practice, see Lesson 7-6 in Algebra 1.



Name: _____

Date: _____

Standards Practice

Linear Functions II.B.7.

Relate direct variation to linear functions and solve problems involving proportional change.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1 Mr. Jordan's history class is going on a walking tour of Columbia, including the State Library and the art museum. The class will walk about two miles and three hours is assigned for the total tour. If the same rate were applied, how far would students be walking on a four-hour tour?

A 2 mi B 2.5 mi C $2\frac{2}{3}$ mi
D 3 mi E 6 mi

1 **C**

- 2 On a trip down Interstate 26, Clayton drives 55 miles in the first hour. On average, the number of miles Clayton drives directly varies with the number of hours he drives. At his current rate, which can Clayton expect?

A He will drive another 55 miles before reaching his destination.
B He will drive a total of 110 miles in the first two hours.
C He will drive 160 miles in the next three hours.
D He will drive at an average speed of 65 miles per hour.
E He will reach his destination in 3.5 hours.

2 **B**

- 3 The value of a is 28 when b is 10, and a is 56 when b is 20. Which relates a and b ?

A $a = \frac{10}{28b}$ B $\frac{a}{b} = \frac{10}{28}$ C $ab = 280$
D $a = 28b$ E $a = 2.8b$

3 **E**

- 4 The ratio of participants to spectators at an oyster shucking contest is 1 to 3. Which linear function relates the proportions of participants p to spectators s ?

A $p = 3s$ B $s = 3p$ C $sp = 3$
D $p + s = 3$ E $s = \frac{1}{3}p$

4 **B**

Read each question carefully and write your answer in the space provided. Be sure to show all your work.

- 5 A five-line advertisement in the newspaper classifieds costs \$8. At the same rate, how much should Pat expect to pay for a 20-line ad? [3]

\$32

For more practice, see Lessons 6-4 and 6-5 in Algebra 1.



Name: _____

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Standards Practice

Linear Functions II.C.1.

Analyze situations involving linear functions and formulate linear equations or inequalities to solve problems.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1 Uri types an average of 3 pages per hour h . If his history report is at least 21 pages long and he has already typed 5 pages, which inequality can he use to find how long it will take to finish typing the report?

A $3h + 5 \leq 21$ B $3h + 5 \geq 21$
C $3h - 5 \leq 21$ D $3h - 5 \geq 21$
E $3h \div 5 \geq 21$

1 **B**

- 2 The combined area of McCormick and Horry counties is 1494 square miles. Which equation can be used to find the area a of McCormick County if McCormick has 774 fewer square miles than Horry?

A $a + 774 = 1494$ B $a - 774 = 1494$
C $a = \frac{1494}{774}$ D $2a + 774 = 1494$
E $2a - 774 = 1494$

2 **D**

Read each question carefully and write your answer in the space provided. Be sure to show all your work.

- 3 In the ACE Basin National Wildlife Refuge, hatchling alligators grow to about 122 centimeters in length by age 5. Adult females rarely exceed 290 centimeters, while adult males can reach lengths greater than 394 centimeters. Write two inequalities that represent the anticipated growths of 5-year-old female and male alligators at 122 centimeters. Indicate the quantity that the variables represent. [3]

**$f + 122 \leq 290$, where f is growth for females in cm and
 $m + 122 \geq 394$, where m is growth for males in cm**

- 4 On a trip to Myrtle Beach, the Belize family stayed at a motel that cost \$85 per night plus a 7% room and sales tax. Write an equation that represents the total cost of the motel bill. Indicate the quantity represented by each of the variables. [2]

Sample answer: $C = 1.07(85d)$, where C is total cost and d is the number of days

For more practice, see Lessons 6-1, 6-2, 6-3, 6-4, INV 6, 6-5, 7-2, 7-3, 7-4, INV 7, 7-5, 7-6, 7-7, and 12-7 in Algebra 1.



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Standards Practice

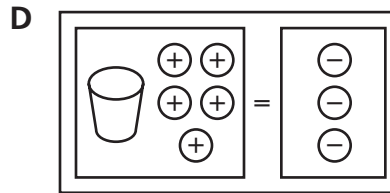
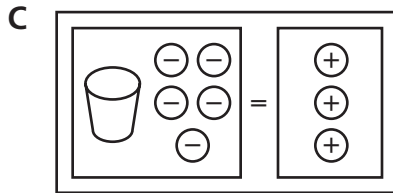
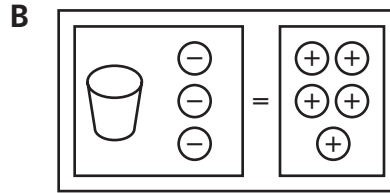
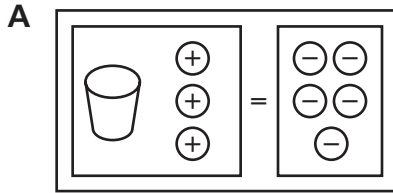
Linear Functions II.C.2.

Investigate methods for solving linear equations and inequalities using concrete models, graphs, and the properties of equality; select a method and solve the equations and inequalities.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1 Which equation mat is modeling $x + (-3) = 5$?

1 **B**



- 2 Which shows the correct procedure for solving

2 **A**

$$3x + 7 - x > 2x + 6 - x$$

A $3x + 7 - x > 2x + 6 - x$

$$3x - x + 7 > 2x - x + 6$$

$$2x + 7 > x + 6$$

$$2x - x + 7 > x - x + 6$$

$$x + 7 > 6$$

$$x + 7 - 7 > 6 - 7$$

$$x > -1$$

B $3x + 7 - x > 2x + 6 - x$

$$3x - 2x > 6 + 7$$

$$x > 13$$

C $3x + 7 - x > 2x + 6 - x$

$$3x - x + 7 > 2x - x + 6$$

$$2x + 7 > x + 6$$

$$2x + x + 7 > x - x + 6$$

$$3x + 7 > 6$$

$$3x > -1$$

$$x > -\frac{1}{3}$$

D $3x + 7 - x > 2x + 6 - x$

$$3x - x + 7 > 2x - x + 6$$

$$2x + 7 > x + 6$$

$$2x - x + 7 > x - x + 6$$

$$x + 7 > 6$$

$$x + 7 - 7 > 6 - 7$$

$$x > 1$$



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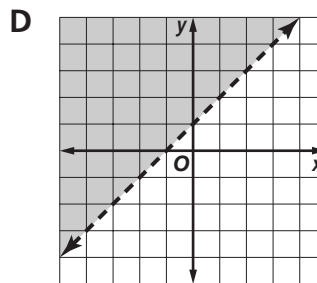
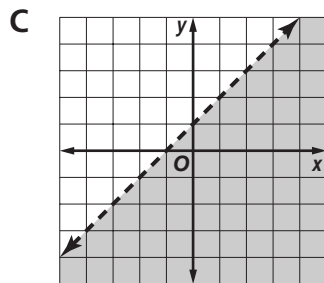
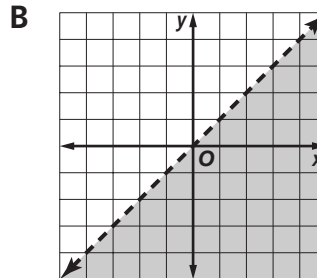
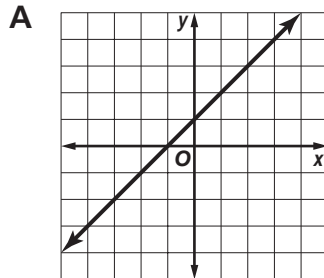
Standards Practice

Linear Functions II.C.2. (continued)

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

3 Which of these is the solution of $y < x + 1$?

3 **C**



4 What does this number line represent?

- A** $4 \leq x \leq 9$ **B** $4 < x \leq 9$
C $4 < x < 9$ **D** $4 > x > 9$
E $4 \geq x \geq 9$



4 **B**

Read each question carefully and write your answer in the space provided. Be sure to show all your work.

5 Simplify and solve the following inequality.

$$-x + 3 - x \geq 8 + x - 11$$

Show all of the steps. Then represent your solution on the number line. [5]



Sample answer:

$$\begin{aligned} -x + 3 - x &\geq 8 + x - 11 \\ -2x + 3 &\geq -3 + x \\ -3x &\geq -6 \\ 3x &\leq 6 \\ x &\leq 2 \end{aligned}$$

For more practice, see Lessons 6-1, 6-2, 6-3, 6-4, INV 6, 6-5, 7-2, 7-3, 7-4, INV 7, 7-5, 7-6, 7-7, and 12-7 in Algebra 1.



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Standards Practice

Linear Functions II.C.3.

Use the commutative, associative, distributive, equality, and identity properties to justify the steps in solving equations and inequalities.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1 Which property allows you to write $\frac{a}{9} = -2$ as $a = -18$? 1 **B**
- A Division Property of Equality
B Multiplication Property of Equality
C Associative Property of Multiplication
D Commutative Property of Multiplication
E Substitution Property of Equality
- 2 Which property justifies the step when you write $7 + 4x + 5$ as $7 + 5 + 4x$? 2 **C**
- A Addition Property of Equality
B Associative Property of Addition
C Commutative Property of Addition
D Transitive Property of Equality
E Symmetric Property of Equality

Read each question carefully and write your answer in the space provided. Be sure to show all your work.

- 3 Name the property that justifies the following step. [1]
- $b = 12(1)$
 $b = 12$ **Multiplicative Identity Property**
- 4 Name the property that justifies each step in the following solution. Write the property next to the step. [4]
- $7(n + 3) \geq -7$ Given
 $7(n) + 7(3) \geq -7$ **Distributive Property**
 $7n + 21 \geq -7$ **Substitution Property**
 $7n + 21 - 21 \geq -7 - 21$ **Subtraction Property of Inequalities**
 $7n + 0 \geq -28$ **Substitution Property**
 $7n \geq -28$ **Additive Identity Property**
 $\frac{7n}{7} \geq \frac{-28}{7}$ **Division Property of Inequalities**
 $n \geq -4$ $\frac{7n}{7} = n$ and $\frac{-28}{7} = -4$

For more practice, see Lessons 6-1, 6-2, 6-3, 6-4, INV 6, 6-5, 7-2, 7-3, 7-4, INV 7, 7-5, 7-6, 7-7, and 12-7 in Algebra 1.



Name: _____

Date: _____

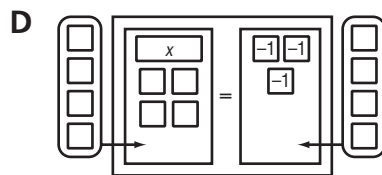
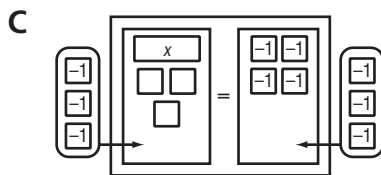
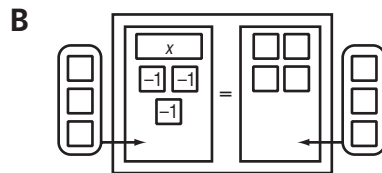
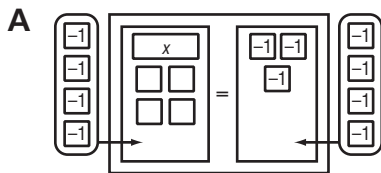
Standards Practice

Linear Functions II.C.4.

Using concrete models for given contexts, interpret and determine the reasonableness of solutions to linear equations and inequalities.

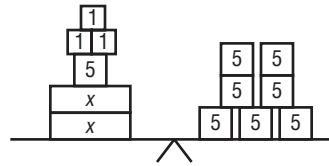
Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1 The temperature in a certain city rose 4 degrees one morning to -3°F . Johann used algebra tiles to model the situation. If he determined a reasonable temperature before it rose 4 degrees, which model did he most likely use?



1 **A**

- 2 Paula-Jo bought 2 identical T-shirts and a pair of shorts on sale. The shorts cost \$8 and the total bill, before tax, was \$35. The balance scales model the situation. To keep the scales in balance, what would be a reasonable amount that Paula-Jo paid for each of the blouses?



2 **D**

- A** \$35 or more **B** between \$30 and \$35
C between \$15 and \$25 **D** between \$10 and \$15
E less than \$10

- 3 Suppose three times a number is more than twice that number plus three. In the model of the inequality shown, white tiles represent the unknown number and white counters represent 1. Of the models that follow, which represents a reasonable solution of the inequality?

$$\square\square\square > \square\square\square\square\square$$

3 **B**

- A** $\square\square\square\square\square > \square\square\square$ **B** $\square > \square\square\square$
C $\square > \square\square\square\square\square$ **D** $\square < \square\square\square$



Name: _____

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Standards Practice

Linear Functions II.D.1.

Analyze situations and formulate systems of linear equations to solve problems.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1 Business Solutions charges \$3.00 plus \$1.00 per page to send faxes. Copy Center charges \$2.00 plus \$1.50 per page. Which system of equations could you use to find the number of pages at which the cost at both shops is the same? Let c = the total cost and let p = the number of pages.

A $c = 2 + p$
 $c = 3 + 1.5p$

B $c = 3 + p$
 $c = 2 + 1.5p$

C $c = 3p$
 $c = 3.5p$

D $c = 5p$
 $c = 2.5p$

1 **B**

- 2 Chione started a home-based business in which she sells hand-woven baskets. It cost her \$150 to start the business and it costs \$20 to produce each basket. She sells baskets for \$80 each. Which system of equations can Chione use to find the break-even point for her business?

A $y = 150 + 80x$
 $y = 20x$

B $y = 150 - 80x$
 $y = 20x$

C $y = 150 + 20x$
 $y = 80x$

D $y = 150 + 80x$
 $y = 20 + x$

2 **C**

- 3 Brett and Aidaya took a 2.5-hour trip along the 48-mile Greenville to Saluda route. They walked their bikes at 3 miles per hour on steep inclines and rode at 22 miles per hour through the rolling countryside. They want to determine the time they spent riding their bicycles. Which system of linear equations should they use? Let r = hours they ride their bikes and w = hours they walk.

A $r + w = 2.5$
 $22r + 3w = 48$

B $r + w = 48$
 $22r + 3w = 2.5$

C $22r + w = 2.5$
 $r + 3w = 48$

D $22r + w = 48$
 $r + 3w = 2.5$

3 **A**



Name: _____

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Standards Practice

Linear Functions II.D.1. (continued)

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 4 Mrs. Valdez invested \$6500 between a fund that pays 4% annual interest and a fund that pays 5% annual interest. The combined annual interest is \$310. If you want to know how much money she invested in each fund, which system of equations could you use? Let x = the fund at 4% and let y = the fund at 5%.

- A** $x + y = 310$
 $0.04x + 0.05y = 6500$
- B** $x + y = 6500$
 $0.4x + 0.5y = 310$
- C** $x + y = 310$
 $4x + 5y = 6500$
- D** $x + y = 6500$
 $0.04x + 0.05y = 310$

4 **D**

Read each question carefully and write your answer in the space provided. Be sure to show all your work.

- 5 The O'Brien and Gaier families purchased tickets for the guided canoe trip at the Audubon Sanctuary. The O'Briens paid \$60 for 2 adults and 3 children. The Gaiers paid \$65 for 3 adults and 2 children. Write a system of equations that you could use to find the price of a ticket for an adult and the price for a child. Identify the variables. [3]

Sample answer: Let a = adult's ticket and let c = child's ticket.

$$2a + 3c = 60$$

$$3a + 2c = 65$$

- 6 Rebecca and Tyrone have been assigned a novel to read for their English class. Rebecca has already read 20 pages and plans to read 10 per week until the novel is finished. Tyrone has read 10 pages and plans to read 15 per week. Write a system of equations you could graph to determine when Rebecca and Tyrone have read the same number of pages. Identify the variables. [3]

Sample answer: Let p = total number of pages and let w = the number of weeks. Graph $p = 10w + 20$ for Rebecca and $p = 15w + 10$ for Tyrone.

For more practice, see Lessons 13-1 and 13-2 in Algebra 1.



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Standards Practice

Linear Functions II.D.2. (continued)

Solve systems of linear equations using concrete models, graphs, tables, and algebraic methods including computer algebra systems, spreadsheets, and graphing calculators.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1 What is the solution of the system of equations shown at the right?
- $$\begin{aligned} y &= x - 4 \\ 2x + y &= 5 \end{aligned}$$
- A $(-3, -1)$ B $(-1, 3)$ C $(1, -3)$
 D $(3, -1)$ E $(3, 1)$

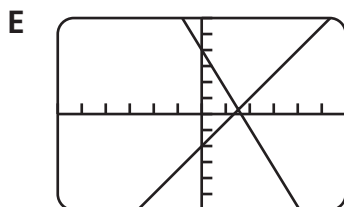
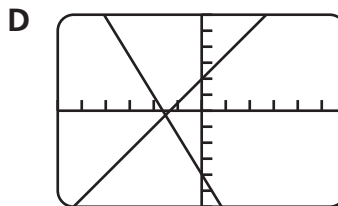
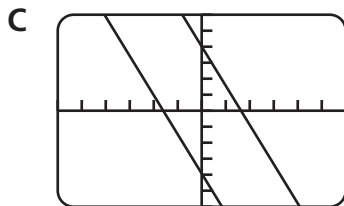
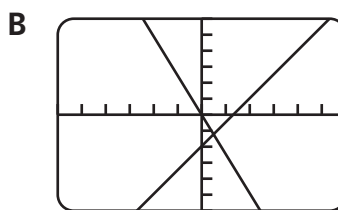
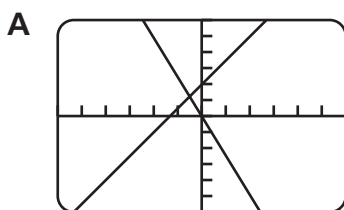
1 **D**

- 2 Column A in the spreadsheet at the right shows the values of x for $y = 1.5x + 1$ in column B and $y = 2x - 3$ in column C. What is the solution of the system of equations?
- A $(3, 8)$ B $(8, 13)$
 C $(13, 3)$ D $(13, 8)$
 E $(13, 13)$

| | A | B | C |
|---|----|------|----|
| 1 | 6 | 10 | 9 |
| 2 | 7 | 11.5 | 11 |
| 3 | 8 | 13 | 13 |
| 4 | 9 | 14.5 | 15 |
| 5 | 10 | 16 | 17 |

2 **B**

- 3 Which graphing calculator screen shows the solution $(1.5, 0.25)$ for the system of equations at the right?
- $$\begin{aligned} y &= 1.5x - 2 \\ y &= -2.5x + 4 \end{aligned}$$

3 **E** 



Name: _____

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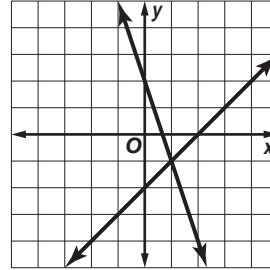
Standards Practice

Linear Functions II.D.2. (continued)

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 4 Which is the solution of the system of equations represented on the graph?

A $(-1, -1)$
B $(-1, 1)$
C $(0, 2)$
D $(1, -1)$
E $(1, 1)$

4 **D**

- 5 Which system of equations has infinitely many solutions?

A $y = 2x + 4$
 $2x - y = -4$
B $y = 2x + 4$
 $-2x - y = 4$
C $y = -2x + 4$
 $-2x + y = 4$
D $y = -2x + 4$
 $2x - y = 4$
E $y = 2x - 4$
 $-2x + y = 4$

5 **A**

Read each question carefully and write your answer in the space provided. Be sure to show all your work.

- 6 Fill in the table for values of x to solve the system of equations $y = -x + 3$ and $y = 2x - 3$. What is the solution? [3]

| x | -2 | -1 | 0 | 1 | 2 | 3 |
|--------------|----|----|----|---|---|---|
| $y = 3x - 2$ | -8 | -5 | -2 | 1 | 4 | 7 |
| $y = -x + 6$ | 8 | 7 | 6 | 5 | 4 | 3 |

The solution is $(2, 4)$.

- 7 Solve the system of equations. [2]

$$\begin{aligned} -2x + 6y &= -2 \\ -x + 4y &= 1 \end{aligned}$$

$(7, 2)$

For more practice, see Lessons 13-1, 13-2, 13-3, 13-4, 13-5, INV 13, and 13-6 in Algebra 1.



Name: _____

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Standards Practice

Linear Functions II.D.3. (continued)

For given contexts, interpret and determine the reasonableness of solutions to systems of linear equations.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

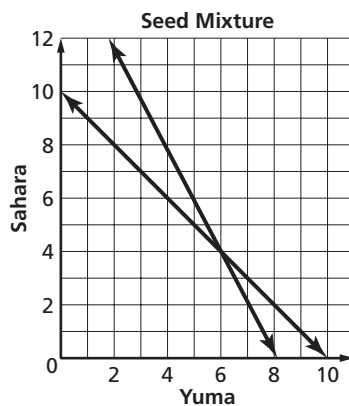
- 1 Bertha can join a health club for \$125 per year and pay \$18 per yoga class. The cost per yoga class if she does not join the club is \$45. Bertha entered the equations for each situation in the spreadsheet below. What is the most reasonable interpretation of the solution in the spreadsheet?

| Number of Yoga Classes | Cost with Club Membership | Cost without Club Membership |
|------------------------|---------------------------|------------------------------|
| 1 | 143 | 45 |
| 2 | 161 | 90 |
| 3 | 179 | 135 |
| 4 | 197 | 180 |
| 5 | 215 | 225 |
| 6 | 233 | 270 |
| 7 | 251 | 315 |

- A** The more yoga classes Bertha takes, the less it costs with club membership.
- B** The fewer yoga classes Bertha takes, the less it costs without club membership.
- C** Yoga classes cost less with club membership for 5 or fewer classes and more without club membership for 5 or more.
- D** Yoga classes cost less with club membership for 5 or more classes and less without club membership for 4 or fewer.
- E** Since there is not an exact match between the number of yoga classes with and without membership, there is no solution.

1 **D** _____

- 2 A nursery specializing in South Carolina grass seed mixed Yuma Bermuda seed at \$5.90 per pound with Sahara Bermuda seed at \$3.15 per pound. The nursery will sell the 10-pound mixture at \$4.80 per pound. The graph solves for the number of pounds of each type of seed in the mixture. According to the graph, the most reasonable solution of the system is
- A** 8 lb of Yuma and 2 lb of Sahara.
- B** 6 lb of Yuma and 4 lb of Sahara.
- C** 4 lb of Yuma and 2 lb of Sahara.
- D** 2 lb of Yuma and 8 lb of Sahara.

2 **B** _____



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Standards Practice

Linear Functions II.D.3. (continued)

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

3 A fisherman rows his boat 18 miles down the Edisto River in 2 hours. The return trip upstream takes 3 hours. Which of the following is a reasonable rate for the current of the river?

- A 1.5 mph B 3.5 mph C 3.6 mph
- D 7.2 mph E 7.5 mph

3 E

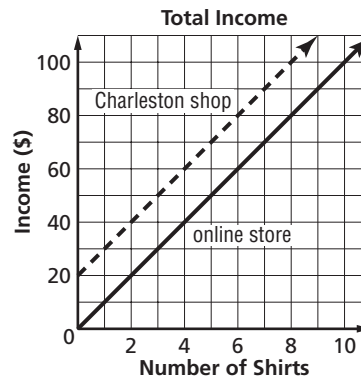
4 In the above problem, what is a reasonable rate at which the fisherman rows his boat?

- A 1.5 mph B 2.2 mph C 3 mph
- D 5.75 mph E 10.5 mph

4 A

Read each question carefully and write your answer in the space provided. Be sure to show all your work.

5 Rami sells embroidered shirts at a virtual store online and at a shop in Charleston. He received a \$20 promotional fee to do business at the online store and he sells the shirts for \$10 each at both businesses. The graph shows the income from the sale of certain numbers of shirts at the two stores. Interpret the system of equations shown on the graph. Your interpretation should include what the solution means in terms of the income generated at the two businesses. [4]



Sample answer: Since the system of equations results in a set of parallel lines, there is no solution of the system. This means that for any given number of shirts that are sold, the amount of income from the sale of the shirts will be the same at both stores. The income from one store will never grow at a faster rate than the income from the other store. Because of the promotional fee, the income from the online store, for the same number of shirts, will always be \$20 more than the income from the Charleston shop.

For more practice, see Lessons 13-1, 13-2, 13-3, 13-4, 13-5, INV 13, and 13-6 in Algebra 1.



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Standards Practice

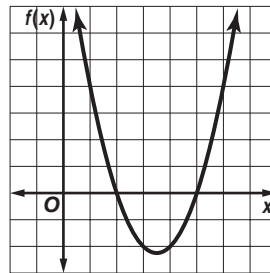
Quadratic and Other Functions III.A.1.

Given the constraints of the problem, determine the domain and range values for quadratic functions.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1 What is the range value of the function represented on the graph when the domain value is 4?

A 6
B 4
C 2
D 1
E -2

1 E

- 2 What is the range value of $f(x) = 2x^2 - 4x - 10$ for $f(5)$?

A 20 B 10 C 0
D -10 E -20

2 A

- 3 Which table has domain and range values that correspond to $f(x) = x^2 + 5x + 1$?

A

| | | | | |
|---|----|----|----|---|
| x | -4 | -2 | 0 | 1 |
| y | -3 | -5 | -1 | 7 |

B

| | | | | |
|---|----|----|---|---|
| x | -4 | -2 | 0 | 1 |
| y | -3 | -5 | 1 | 7 |

C

| | | | | |
|---|----|----|---|---|
| x | -4 | -2 | 0 | 1 |
| y | -3 | -5 | 1 | 5 |

D

| | | | | |
|---|----|----|----|---|
| x | -4 | -2 | 0 | 1 |
| y | -5 | -3 | -1 | 5 |

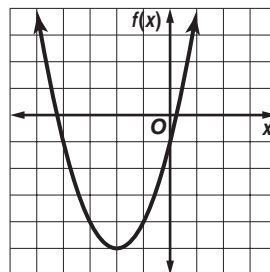
E

| | | | | |
|---|----|----|----|----|
| x | -4 | -2 | 0 | 1 |
| y | -5 | -3 | -1 | -5 |

3 B

- 4 When the range value of the function shown on the graph is -5, what is the domain value?

A -5 B -4
C -2 D -1
E 4

4 C

- 5 What is the range of the function represented on the graph above?

A all real numbers B $y \leq -5$
C $y < -5$ D $y \geq -5$
E $y > -5$

5 D



Name: _____

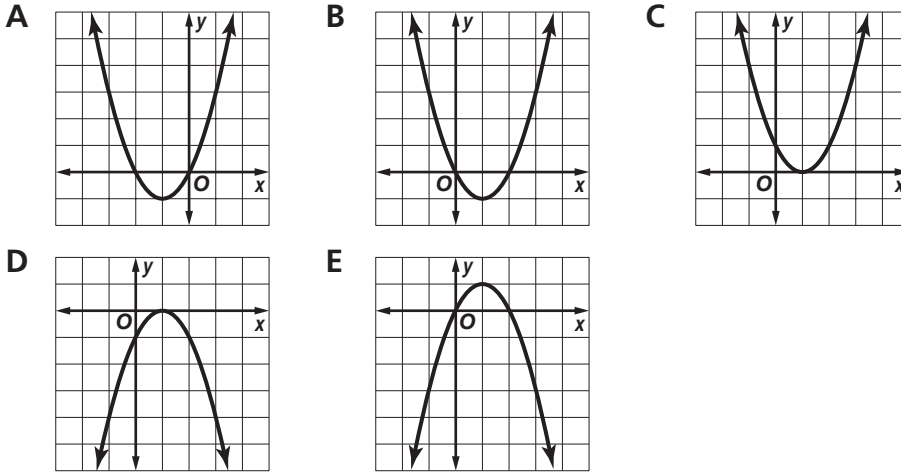
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Standards Practice

Quadratic and Other Functions III.A.1. (continued)

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 6 Which graph represents a function whose domain is all real numbers and whose range is $f(x) \leq 1$?

6 **E** 

- 7 What is the range of $f(x) = -3x^2 + 10x - 8$ if the domain is $\{1, 2, 3\}$?
- A** $\{-1, 0, -5\}$ **B** $\{-1, 0, 5\}$ **C** $\{0, -2, -8\}$
D $\{0, 2, 8\}$ **E** $\{1, 0, -5\}$

7 **A**

Read each question carefully and write your answer in the space provided. Be sure to show all your work.

- 8 Complete the table for $f(x) = x^2 + 2x - 1$. Then give the domain and range of the function as shown in the table. [3]

D $= \{-3, -1, 0, 2, 4\}$

R $= \{2, -2, -1, 7, 23\}$

| x | f(x) |
|----|-----------|
| -3 | 2 |
| -1 | -2 |
| 0 | -1 |
| 2 | 7 |
| 4 | 23 |

- 9 What is the domain and range of $f(x) = 25 - x^2$? [2]

The domain is all the real numbers.

The range is $f(x) \leq 25$.

For more practice, see Lesson 11-1 in Algebra 1.



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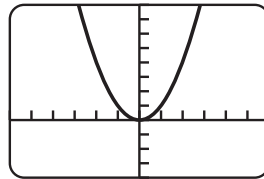
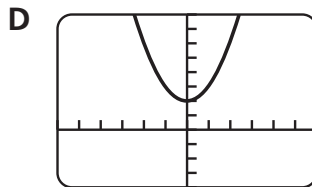
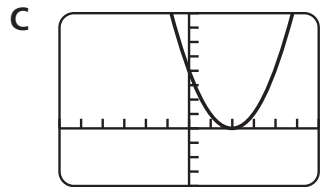
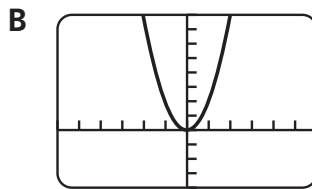
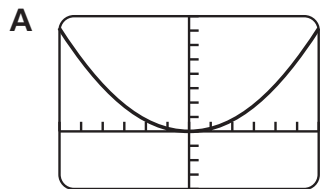
Standards Practice

Quadratic and Other Functions III.A.2.

With and without using a graphing calculator, investigate, describe, and predict the effects of changes in the coefficient a on the graph of $y = ax^2$.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1 The graph of $y = ax^2$ is shown at the right.
Which screen shows the graph of $y = 0.2x^2$?

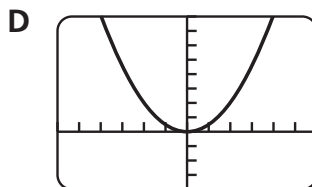
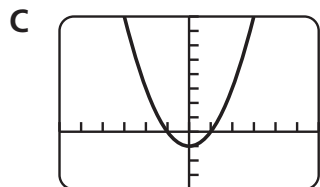
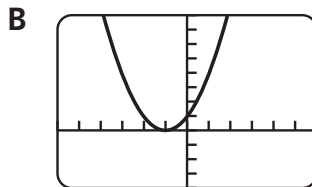
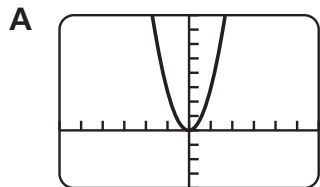
1 **A** 

- 2 Which statement best describes the changes to the graph of $y = x^2$ when the value of the coefficient of x^2 is -3 ?

2 **B**

- A The graph becomes narrower and shifts down 3 units.
B The graph becomes narrower and opens downward.
C The graph becomes narrower and shifts 3 units to the left.
D The graph becomes wider and opens downward.
E The graph becomes wider and shifts down 3 units.

- 3 Which calculator screen shows a value of $a < 1$ for the graph of $y = ax^2$?

3 **D** 



Name: _____

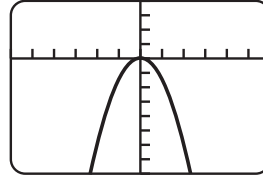
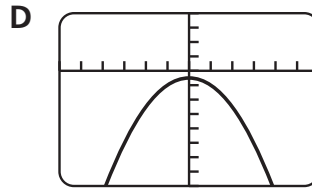
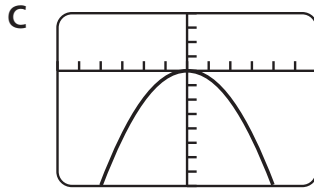
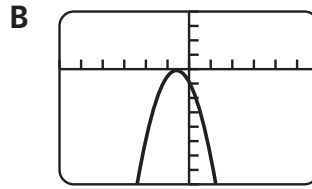
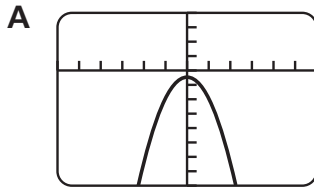
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Standards Practice

Quadratic and Other Functions III.A.2. (continued)

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 4 The calculator screen at the right shows the graph of $y = -\frac{3}{2}x^2$. Which screen shows the graph of $y = -\frac{1}{2}x^2$?

4 **C** 

Read each question carefully and write your answer in the space provided. Be sure to show all your work.

- 5 Does the graph of $y = -9x^2 + 2$ change position when the value of the coefficient of x^2 is increased by 2? Explain. [4]

No; sample answer: Changing the value of the coefficient does not change the position of the parabola. The coefficient affects the shape of the parabola. If the coefficient of x^2 is increased by 2 on the graph of $y = -9x^2 + 2$, the parabola on the graph of $y = -7x^2 + 2$ will be wider than the parabola of $y = -9x^2 + 2$.

- 6 Explain how the value of a affects the graph of $y = ax^2$. Provide examples to support your explanation. [4]

Sample answer: When the value of a is positive, the graph opens upward, and when it is negative, it opens downward. The graph of $y = 4x^2$ opens upward and the graph $y = -4x^2$ opens downward. As the value of a becomes greater, the parabola narrows, and as the value of a becomes smaller, the parabola widens. The graph of $y = 0.1x^2$ is wider than the graph of $y = x^2$. The graph of $y = 2x^2$ is narrower than the graph of $y = x^2$.

For more practice, see Lesson 11-2 in Algebra 1.



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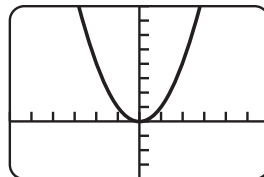
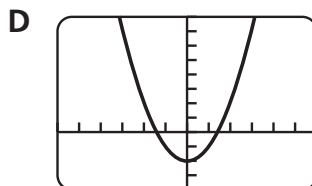
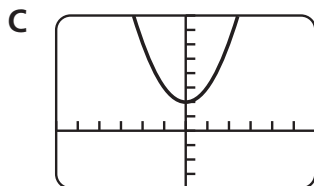
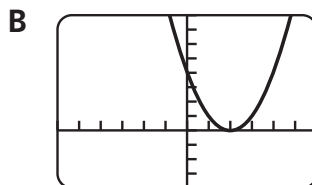
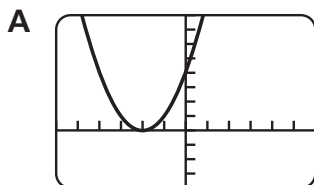
Standards Practice

Quadratic and Other Functions III.A.3.

With and without using a graphing calculator, investigate, describe, and predict the effects of changes in the constant c on the graph of $y = x^2 + c$.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1 The graph of $y = x^2 + c$ is shown at the right. Which of the following screens shows the graph of $y = x^2 - 2$?

1 **D** 

- 2 Which best describes the similarities between the graphs of $y = x^2$ and $y = (x - 6)^2$ on a graphing calculator?

2 **A**

- A The graph $y = (x - 6)^2$ is the same as the graph of $y = x^2$ translated 6 units to the right.
B The graph $y = (x - 6)^2$ is the same as the graph of $y = x^2$ translated 6 units to the left.
C The graph $y = (x - 6)^2$ is the same as the graph of $y = x^2$ translated 6 units down.
D The graph $y = (x - 6)^2$ is the same as the graph of $y = x^2$ translated 6 units up.
E The graph $y = (x - 6)^2$ is the same as the graph of $y = x^2$ after it is reflected and moved 6 units down.

- 3 A change in c on the graph of $y = x^2 + c$ will affect

3 **B**

- A the width of the graph.
B the vertical position of the graph.
C the horizontal position of the graph.
D whether the graph opens upward or downward.
E whether the graph opens to the left or the right.



Name: _____

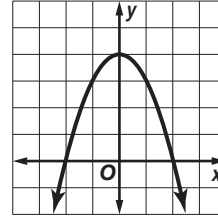
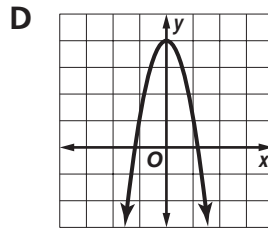
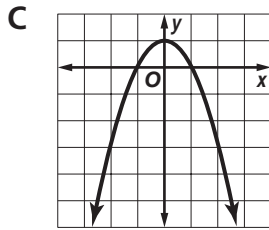
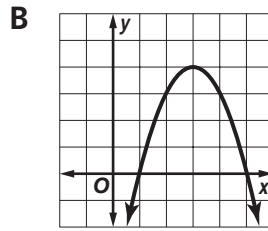
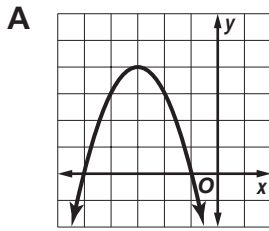
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Standards Practice

Quadratic and Other Functions III.A.3. (continued)

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 4 The calculator screen at the right shows the graph of $y = -x^2 + 4$, where the constant c is 4. Which screen shows the position of the graph after the value of c is decreased by 3?

4 **C** 

Read each question carefully and write your answer in the space provided. Be sure to show all your work.

- 5 Describe how the graphs of $y = x^2 + 10$ and $y = x^2 - 7$ are similar and different from the graph of $y = x^2$. [3]

The graphs of $y = x^2 + 10$ and $y = x^2 - 7$ are similar to the graph of $y = x^2$ in that they open upward and have the same shape. The graph of $y = x^2 + 10$ is the graph of $y = x^2$ translated up 10 units and the graph of $y = x^2 - 7$ is the graph of $y = x^2$ translated down 7 units. Each graph has a different vertex.

- 6 Describe the effects on the graph of $y = (x + c)^2$ when c is 13. [2]

The graph of $y = (x + c)^2$ moves 13 units horizontally to the left. The graph moves from a vertex of $(0, 0)$ to a vertex of $(-13, 0)$.

- 7 Predict the effect(s) on the vertex of the graph of $y = 2x^2 + 1$ when the graph is translated down 4 units. [1]

The vertex of the graph will change from $(0, 1)$ to $(0, -3)$.

For more practice, see Lesson 11-2 in Algebra 1.



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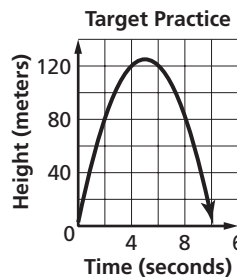
Standards Practice

Quadratic and Other Functions III.A.4.

For problem situations, analyze graphs of quadratic functions and draw conclusions.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

The graph shows the path of an arrow shot into the air at an initial velocity of 49 meters per second. Use the graph to answer Questions 1–3.



- 1 If the arrow does not encounter a target, which part of the graph gives the time that the arrow hits the ground?

A The vertex gives the time at 5 s.
 B The vertex gives the time at 125 s.
 C The y -intercept gives the time at less than 5 s.
 D The x -intercept gives the time at about 10 s.

1 D

- 2 The arrow hits a target in 2 seconds. At about what height is the target?

A 85 m B 80 m C 75 m
 D 70 m E 65 m

2 B

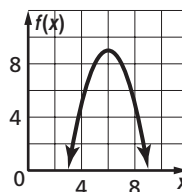
- 3 Suppose an archer takes aim and shoots at a target placed 130 meters uphill from where the archer stands. What is a reasonable conclusion to draw from the graph?

A The arrow hits the target in 125 s.
 B The arrow hits the target at 5 m.
 C Since a parabola is symmetric, the arrow could hit the target at one of either two times or two distances.
 D The arrow cannot hit the target since it cannot reach a height greater than 125 m.
 E The arrow will begin to fall if it does not hit the target in 10 s.

3 D

- 4 Emil graphed the function shown to find two numbers whose product is 27 and whose sum is 12. What can he conclude from the graph?

A Since the domain and range of the graph do not include the numbers 27 and 12, the graph is incorrect.
 B One number is 6, the other is unknown.
 C One number is 9, the other is unknown.
 D The numbers are 9 and 6.
 E The numbers are 9 and 3.

4 E



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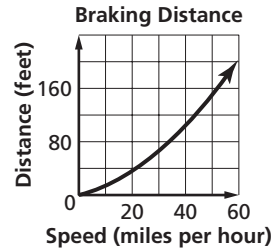
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Standards Practice

Quadratic and Other Functions III.A.4. (continued)

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

The graph at the right shows the distance a car travels after the brakes are applied. On this graph, the stopping distance is a function of speed under optimal highway conditions. It does not consider reaction time, which adds to distance. Use the graph to answer Questions 5–6.



- 5 Dan applies the brakes when he sees that traffic ahead has stopped for construction. If Dan is driving at 25 miles per hour, about how far will he travel before he stops?
- A 15 ft B 20 ft C 25 ft
D 35 ft E 50 ft

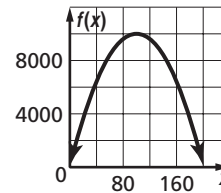
5 E

- 6 If Dan increases his speed to 50 miles per hour after the construction site, by how much does his stopping distance increase?
- A 25 ft B 50 ft C 75 ft
D 100 ft E 150 ft

6 D

Read each question carefully and write your answer in the space provided. Be sure to show all your work.

- 7 Mr. and Mrs. Secci own a bed and breakfast in Beaufort. Past records indicate they can expect to rent rooms 200 times during the off-season. Off-season profits can be modeled by the function $f(x) = -x^2 + 200x$, where x is the price charged each night per room. Use the graph to draw conclusions about how much the Secci's should charge per room per night to maximize profits. To support your answer, refer to the vertex and x -intercepts of the graph. [4]



Sample answer: The vertex at (100, 10,000) shows that the Secci's can maximize profits (\$10,000) if they rent rooms for \$100 per night. As they increase the price of a room to more than \$100 per night, their profit margin decreases until it reaches nothing at \$200 per night, shown at the x-intercept at 200.

For more practice, see Lessons 11-1, 11-2, and 11-3 in Algebra 1.



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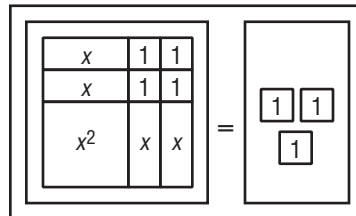
Standards Practice

Quadratic and Other Functions III.A.5.

Solve quadratic equations using concrete models, tables, graphs, and algebraic methods that include factoring and using the quadratic formula as well as computer algebra systems, spreadsheets, and graphing calculators.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1 The algebra tiles solve $x^2 + 4x = -1$ by completing the square. If you take the square root of each side of the model, the solutions are

1 **D**

- A 2 ± 3 .
 B $2 \pm \sqrt{3}$.
 C -2 ± 3 .
 D $-2 \pm \sqrt{3}$.
 E $-\sqrt{2} \pm \sqrt{3}$.

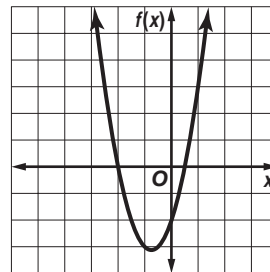
- 2 According to the table at the right, which are the solutions of $x^2 - 8x = -15$?

| x | $f(x)$ |
|-----|--------|
| 1 | 8 |
| 2 | 3 |
| 3 | 0 |
| 4 | -1 |
| 5 | 0 |
| 6 | 8 |

2 **E**

- A 0, 3
 B 0, 5
 C 1, 6
 D 1, 8
 E 3, 5

- 3 The related function of $2x^2 + 3x - 2 = 0$ is graphed at the right. Which are the solutions of the equation?

3 **A**

- A $-2, 0 < x < 1$
 B $-1, -3$
 C $0, -2$
 D $1, 3$
 E $0 < x < 1, 2$

- 4 If you use factoring to solve $x^2 - 6x + 8 = 0$, which are the solutions?

4 **E**

- A $-4, 2$
 B $-2, -4$
 C $-2, 4$
 D $1, 8$
 E $2, 4$



Name: _____

Date: _____

Standards Practice

Quadratic and Other Functions III.A.5. (continued)

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 5 Use a graphing calculator to solve $4x^2 + 16x = -14$. Which are the solutions, rounded to the nearest tenth?

A -4.7, 0.7
B -2.7, -1.3
C -1.3, 2.7
D -0.7, 4.7
E 1.3, 2.7

5 **B**

- 6 Isabel used the spreadsheet below to solve $2x^2 - 8x + 6 = 0$. Which are the solutions of the equation?

A 18, -24
B 2, -8
C 3, 6
D 1, 3
E 1, 2

| x | $2x^2$ | $-8x$ | +6 | $f(x)$ |
|----|--------|-------|----|--------|
| -1 | 2 | 8 | 6 | 16 |
| 0 | 0 | 0 | 6 | 6 |
| 1 | 2 | -8 | 6 | 0 |
| 2 | 8 | -16 | 6 | -2 |
| 3 | 18 | -24 | 6 | 0 |
| 4 | 32 | -32 | 6 | 6 |
| 5 | 50 | -40 | 6 | 16 |

6 **D**

Read each question carefully and write your answer in the space provided. Be sure to show all your work.

- 7 Use the Quadratic Formula to solve $x^2 + 6x + 3 = 0$. Round to the nearest tenth if necessary. Show the steps you used to solve the problem. [3]

-0.6, -5.4;

$$\begin{aligned} \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} &= \frac{-6 \pm \sqrt{(6)^2 - 4(1)(3)}}{2(1)} \\ &= \frac{-6 \pm \sqrt{36 - 12}}{2} \text{ or } \frac{-6 \pm \sqrt{24}}{2} \text{ or } \frac{-6 \pm 2\sqrt{6}}{2} \\ &= -3 + \sqrt{6} \text{ or } \approx -0.6 \text{ and } -3 - \sqrt{6} \text{ or } \approx -5.4 \end{aligned}$$

- 8 Use any method to solve $2x^2 - 10x + 12 = 0$. [2]

2, 3

For more practice, see Lessons 11-3, 11-4, 11-5, and 11-6 in Algebra 1.



Name: _____

Date: _____

Standards Practice

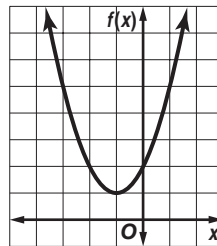
Quadratic and Other Functions III.A.6.

Relate the solutions of quadratic equations to the roots of their functions.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

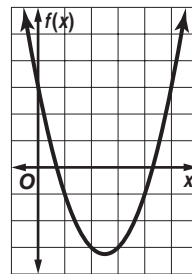
- 1 What are the root(s) of the quadratic equation whose function is graphed at the right?

- A -1
- B -1, 1
- C 2
- D 2, 0
- E There are no real roots.

1 E

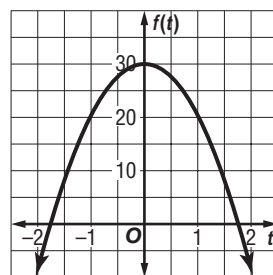
- 2 The related function of $x^2 - 5x + 3 = 0$ is graphed at the right. Which statement describes the solution?

- A There is one root at 3, so the solution is 3.
- B There is a double root at -3, so the solution is -3.
- C There appear to be no real roots since the parabola does not cross the x -axis at integral numbers.
- D It appears there are 2 roots, one root between 0 and 1 and one root between 4 and 5, so the solutions are $0 < x < 1$ and $4 < x < 5$.
- E It appears there are 2 roots between 0 and 1 and at 3, so the two solutions are $0 < x < 1$ and 3.

2 D

Read each question carefully and write your answer in the space provided. Be sure to show all your work.

- 3 Part of the function graphed at the right could be used to model the path of a stone dropped from a bridge into the river below. The solution of the related equation gives the time t in seconds that the stone is in the air before it plunges into the river. Refer to the roots of the function to estimate the time that the stone is in the air. [2]



Sample answer: Since t represents time, the negative root between -2 and -1.5 does not make sense for the situation. The solution is between 1.5 s and 2 s since the root is between 1.5 and 2.

For more practice, see Lessons 11-3, 11-4, 11-5, and 11-6 in Algebra 1.



Name: _____

Date: _____

Standards Practice

Quadratic and Other Functions III.B.1.

Use patterns to generate the laws of exponents and apply the laws of exponents in problem-solving situations.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1 Which is another way to write $y^2 \cdot y^6$? 1 **C**
- A $(2 \times 6)y$ or $12y$
B $(2 \times 6)(y \times y)$ or $12y^2$
C $(y \cdot y)(y \cdot y \cdot y \cdot y \cdot y \cdot y)$ or y^8
D $y \cdot y \cdot y \cdot y \cdot y \cdot y \cdot y \cdot y \cdot y \cdot y \cdot y \cdot y \cdot y$ or y^{12}
E $y \cdot y - y \cdot y \cdot y \cdot y \cdot y \cdot y$ or y^{-4}
- 2 Which pattern shows how to find $(4^3)^2$? 2 **B**
- A $4 \times 4 \times 4 \times 4 \times 4$ or 4^5 B $(4 \times 4 \times 4)(4 \times 4 \times 4)$ or 4^6
C $(4 \times 3)(4 \times 3)$ or 12^2 D $12 \times 12 \times 12 \times 12 \times 12$ or 12^5
E $(12 \times 12 \times 12)(12 \times 12 \times 12)$ or 12^6
- 3 Which pattern can be used to simplify $\frac{7^5}{7^3}$? 3 **E**
- A $\frac{(7 \cdot 5)(7 \cdot 5)(7 \cdot 5)(7 \cdot 5)(7 \cdot 5)}{(7 \cdot 5)(7 \cdot 5)(7 \cdot 5)}$ or 35^8
B $\frac{(7 \cdot 5)(7 \cdot 5)(7 \cdot 5)(7 \cdot 5)(7 \cdot 5)}{(7 \cdot 5)(7 \cdot 5)(7 \cdot 5)}$ or 35^2
C $7 \cdot 7 \cdot 7 \cdot 7 \cdot 7 \cdot 7 \cdot 7 \cdot 7 \cdot 7 \cdot 7 \cdot 7 \cdot 7 \cdot 7 \cdot 7 \cdot 7$ or 7^{15}
D $7 \cdot 7 \cdot 7 \cdot 7 \cdot 7 \cdot 7 \cdot 7 \cdot 7$ or 7^8
E $\frac{7 \cdot 7 \cdot 7 \cdot 7 \cdot 7}{7 \cdot 7 \cdot 7}$ or 7^2
- 4 The area of a rectangle is $12x^3y^2$ square units. The width is $4xy$. What is the length of the rectangle? 4 **A**
- A $3x^2y$ units B $3x^3y^2$ units C $8x^2y$ units
D $8x^4y^3$ units E $48x^4y^3$ units

Read each question carefully and write your answer in the space provided. Be sure to show all your work.

- 5 Katrina can select the color of stone and the metal for her class ring in 10^{12} ways. She can select for insignias in 10^{18} ways. In how many ways can she select a class ring? [1]

10^{30} ways

For more practice, see Lessons 8-1, 8-2, 8-3, 8-4, 8-5, 8-6, 8-7, 11-1, 11-2, 11-3, 11-4, 11-5, 11-6, and 11-7 in Algebra 1.



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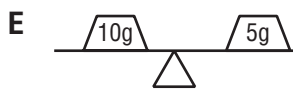
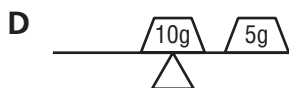
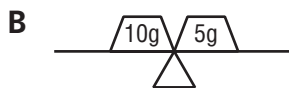
Standards Practice

Quadratic and Other Functions III.B.2.

Analyze data and represent situations involving inverse variation using concrete models, tables, graphs, or algebraic methods as well as computer algebra systems, spreadsheets, and graphing calculators.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1 Two objects can balance a lever if their distances from the fulcrum of the lever are inversely proportional to their masses. Which diagram best shows the positions of a 5-gram and 10-gram mass balanced on a lever?

1 E

- 2 In Ohm's Law, $E = IR$, where E is voltage measured in volts, I is current measured in amperes, and R is resistance measured in ohms. In this formula, resistance varies inversely as the current. Which table shows that R is inversely proportional to I ?

A

| | | | | |
|-----|----|----|-----|----|
| R | 10 | 20 | 40 | 50 |
| I | 10 | 5 | 2.5 | 2 |

B

| | | | | |
|-----|----|----|----|----|
| R | 10 | 20 | 40 | 50 |
| I | 5 | 10 | 20 | 25 |

C

| | | | | |
|-----|----|-----|------|----|
| R | 10 | 20 | 40 | 50 |
| I | 10 | 2.5 | 1.25 | 1 |

D

| | | | | |
|-----|-----|-----|-----|-----|
| R | 10 | 20 | 40 | 50 |
| I | 0.1 | 0.2 | 0.4 | 0.5 |

E

| | | | | |
|-----|-----|-----|-----|-----|
| R | 10 | 20 | 40 | 50 |
| I | 100 | 200 | 400 | 500 |

2 A

- 3 The number of rangers needed to clear a path in Harbison State Forest varies inversely as the number of days it takes to clear it. Suppose you know that it takes 3 rangers r a total of 8 days d to clear a path. Since the constant is 24, which equation can you use to find values of d for given values of r ?

A $d = 24r$

B $d = \frac{r}{24}$

C $d = \frac{24}{r}$

D $d = r + 24$

E $d = 24 - r$

3 C



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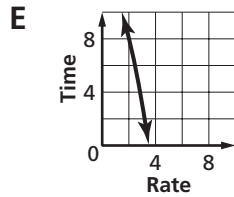
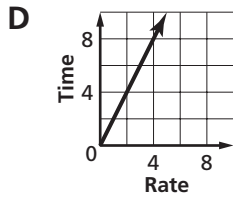
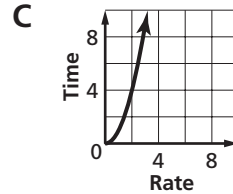
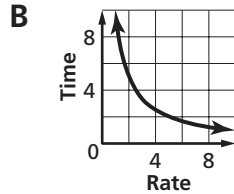
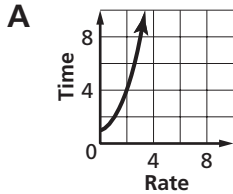
Standards Practice

Quadratic and Other Functions III.B.2. (continued)

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 4 The time it takes Glover to walk 10 miles to the beach varies inversely as the rate at which he walks. Which graph represents this situation?

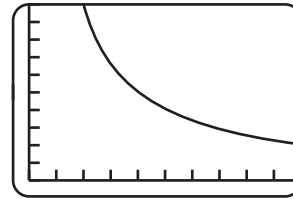
4 **B**



- 5 The graphing calculator screen shows a situation in which y is inversely proportional to x . Which statement describes the situation?

5 **D**

- A** When y increases by a factor of 2, x increases by a factor of 2.
B When y increases by a factor of 2, x increases by a factor of 4.
C When y increases by half, x decreases by a factor of 2.
D When y decreases by a factor of 2, x increases by a factor of 2.
E When y decreases by half, x increases by a factor of 4.



Read each question carefully and write your answer in the space provided. Be sure to show all your work.

- 6 To loosen a bolt, you need to apply force to the wrench handle. Describe the values given in the spreadsheet in terms of inverse variation. [2]

Sample answer: Force decreases as the length of the wrench handle increases. Force varies inversely as the length of the wrench handle.

| Force (lb) | Length of Handle (in.) |
|------------|------------------------|
| 300.0 | 7 |
| 262.5 | 8 |
| 233.3 | 9 |
| 210.0 | 10 |
| 190.9 | 11 |
| 175.0 | 12 |
| 161.5 | 13 |

For more practice, see Lesson 6-6 in Algebra 1.



Name: _____

Date: _____

Standards Practice

Quadratic and Other Functions III.B.3.

Analyze data and represent situations involving exponential growth and decay using concrete models, tables, graphs, or algebraic methods as well as computer algebra systems, spreadsheets, and graphing calculators.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1 Which table displays exponential behavior?

A

| | | | | |
|---|----|----|----|----|
| x | 4 | 6 | 8 | 10 |
| y | 20 | 25 | 30 | 35 |

B

| | | | | |
|---|----|----|----|-----|
| x | 40 | 65 | 90 | 115 |
| y | 10 | 8 | 6 | 4 |

C

| | | | | |
|---|------|----|------|-----|
| x | 18 | 15 | 12 | 9 |
| y | 48.5 | 74 | 99.5 | 125 |

D

| | | | | |
|---|-----|-----|----|------|
| x | 2 | 5 | 8 | 11 |
| y | 400 | 100 | 25 | 6.25 |

E

| | | | | |
|---|-----|---|-----|----|
| x | 7 | 9 | 12 | 15 |
| y | 0.5 | 1 | 1.5 | 2 |

1 **D**

- 2 A microbiologist started a lab culture with 25 cells. The number of cells doubles every 4 hours. Which equation could be used to find the number of cells after a given number of hours?

A $y = 25(2^{\frac{x}{4}})$

B $y = \frac{1}{6}(2^x)$

C $y = 25(4^x)$

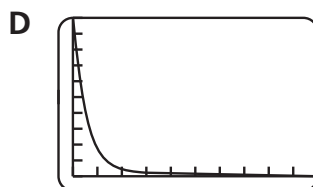
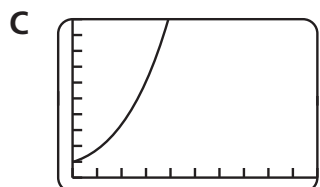
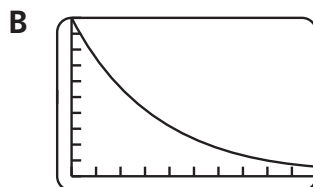
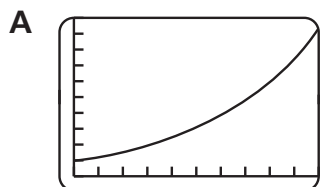
D $y = \frac{1}{6}(4^x)$

E $y = 4(25^x)$

2 **A**

- 3 Tamika bought a computer in 2002. The spreadsheet gives its value after 5 years. Which graphing calculator screen most likely represents the values shown in the spreadsheet?

| Year | Value |
|------|----------|
| | 1000 |
| 1 | 750 |
| 2 | 562.5 |
| 3 | 421.875 |
| 4 | 316.4063 |
| 5 | 237.3047 |

3 **B**



Name: _____

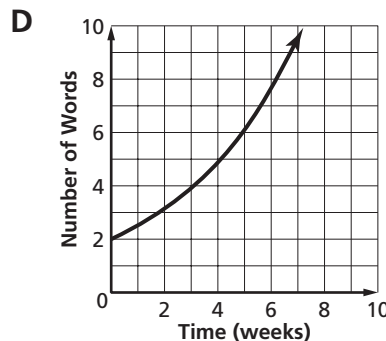
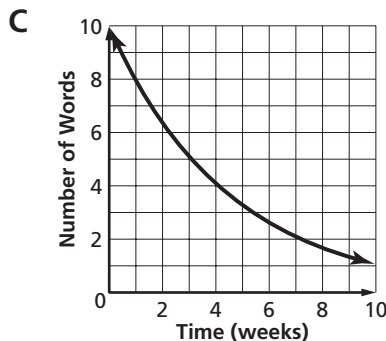
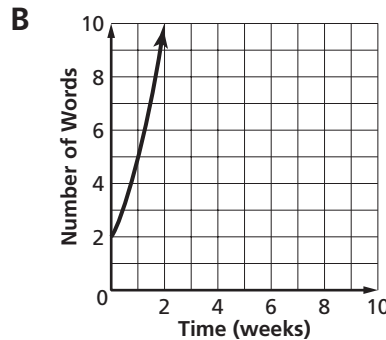
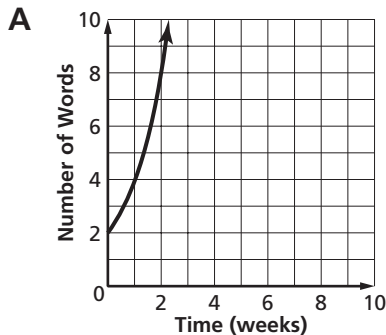
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Standards Practice

Quadratic and Other Functions III.B.3. (continued)

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 4 Emma is studying for a national vocabulary test. She wants to learn one fourth more new words as the previous week each week until the exams. She learned two new words this week. Which graph represents Emma's goal?

4 D 

Read each question carefully and write your answer in the space provided. Be sure to show all your work.

- 5 The formula for compound interest is $A = P\left(1 + \frac{r}{n}\right)^{nt}$, where A is the total amount of the investment, P is the principal, or the initial amount invested, r is the annual rate of interest expressed as a decimal, n is the number of times interest is compounded each year, and t represents the number of years the money is invested. Write a problem that gives the principal P , the rate r , the number of times interest is compounded n , and the number of years the money is invested t . Write the formula for your problem, but do not solve it. [4].

Sample answer: Nick invested \$500 in a fund that compounds quarterly at 6 percent interest. How much did he have to withdraw after 5 years? $A = 500\left(1 + \frac{0.06}{4}\right)^{4(5)}$

For more practice, see Lesson 11-7 in Algebra 1.



Name: _____

Date: _____

Test Practice

Sample Test 1

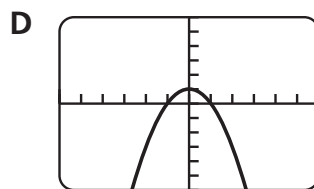
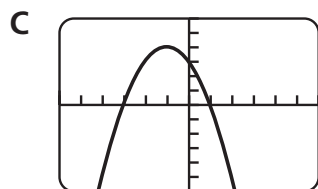
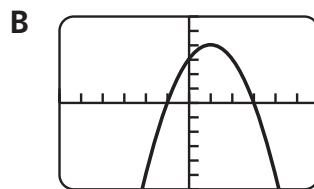
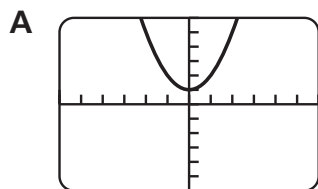
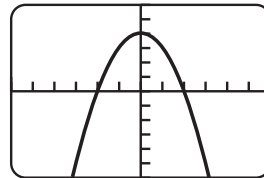
Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1 Customers who use electricity in off-peak hours in Orangeburg pay a \$12 meter fee per month plus \$0.0365 per kilowatt-hour. Which equation represents the total cost c of a monthly electric bill as a function of kilowatt-hours k ? **II.A.3.**

- A $c = 0.0365k + 12$
 B $c = 0.0365(k + 12)$
 C $c + 12 = 0.0365k$
 D $k = 0.0365(c + 12)$
 E $k = 0.0365c + 12$

1 **A**

- 2 A graph of $y = -x^2 + c$ is shown on the graphing calculator at the right. Which shows the graph of $y = -x^2 + 1$? **III.A.3.**

2 **D**

- 3 Quentin has already spent 13 hours working on a history project about the revolutionary battle at Cowpens, South Carolina, in 1781. He figures that the total project will take no more than 50 hours to complete. Quentin wonders how long it will take him to finish if he works on the project 6 hours per week. How could you represent this situation with an inequality? **I.A.3.**

- A $6w - 13 \leq 50$
 B $6w + 13 \leq 50$
 C $6w + 13 \geq 50$
 D $6w + 13 < 50$
 E $6w + 13 > 50$

3 **B** 



Name: _____

Date: _____

Test Practice

Sample Test 1 (continued)

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 4 Darrin deposited \$1800 into an account that compounds quarterly at 5%. Which formula could he use to find the balance of his account after 4 years? Assume that Darrin does not make additional deposits to his account, nor does he withdraw any of the funds. **III.B.3.**

A $A = 1800\left(1 - \frac{0.05}{4}\right)^{4(4)}$

B $A = 1800\left(1 - \frac{0.05}{4}\right)^4$

C $A = 1800\left(1 + \frac{0.5}{4}\right)^{4(4)}$

D $A = 1800\left(1 + \frac{0.5}{4}\right)^4$

E $A = 1800\left(1 + \frac{0.05}{4}\right)^{4(4)}$

4 **E**

- 5 Write 0.00165 in scientific notation. **I.C.1.**

A 16.5×10^{-5}

B 1.65×10^{-5}

C 1.65×10^{-4}

D 1.65×10^{-3}

E 1.65×10^2

5 **D**

- 6 For what value of x is $-5x + 8 = -6$ a true statement? **I.D.3.**

A 2.8

B 1.6

C 0.4

D -0.4

E -2.8

6 **A**

- 7 Ben's CAD teacher said that supplies would cost no more than \$125 for the semester. Ben has already spent \$14 and knows there are two more projects p coming up that will cost about the same. Which inequality can he use to find how much he should spend on one project? **II.C.1.**

A $125 \geq 2p - 14$

B $125 \geq 2p + 14$

C $125 \leq 2p - 14$

D $125 \leq 2p + 14$

E $125 < 2p + 14$

7 **B**

- 8 The relationship between c and d is such that d is always 6 more than c . Which function represents this relationship? **I.C.3.**

A $c = d + 6$

B $c = 6d$

C $d = c + 6$

D $d = c - 6$

E $d = 6 - c$

8 **C**

- 9 The equation that best describes the graph is **I.B.1.**

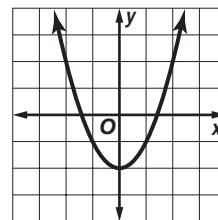
A $y = x^2 - 2$

B $y = 2x - 2$

C $y = 2^x$

D $y = 2x^2$

E $y = 2x^2 - 2$

9 **A** 



Name: _____

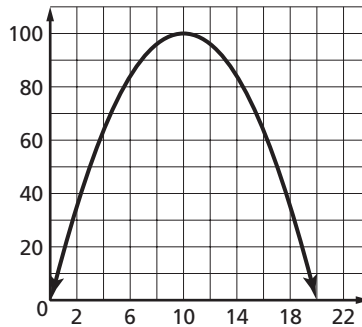
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Test Practice

Sample Test 1 (continued)

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 10 Mr. Meeker has 40 feet of fencing to enclose a rectangular area for an herb garden. The graph at the right shows the maximum area he can enclose with this length of fencing. What can you conclude from the graph? **III.A.4.**
- A The maximum area is 20 ft^2 .
 B The maximum area is 100 ft^2 .
 C The length is 20 ft, so the width is 5.
 D The width is 10 ft and the length is 20 ft.
 E The maximum area must be 200 ft^2 .

10 **B**

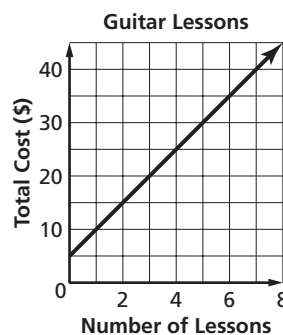
- 11 Which is the result if you simplify $-4(-6x - 2y + 4) - 12x + 5$? **I.D.6.**
- A $-36x - 8y - 16$ B $-24x + 8y - 1$
 C $12x + 8y + 9$ D $12x + 8y - 11$
 E $72x + 8y - 36$

11 **D**

- 12 The value of $f(x) = 3x - 2$ for $f(-2)$ is **I.D.1.**
- A -8 . B -6 .
 C $\frac{1}{3}$. D 6 .
 E 8 .

12 **A**

- 13 What relationship, if any, is shown in the graph? **I.A.2.**
- A The first guitar lesson is \$5.
 B The total cost c for ℓ lessons is represented by $c = 5\ell$.
 C The total cost c for ℓ lessons is represented by $c = 5 + 5\ell$.
 D The more lessons you buy, the less it costs per lesson.
 E There appears to be no relationship between number of lessons and total cost.

13 **C**

- 14 Which is an equation of the line passing through $(-3, 2)$ and $(1, -6)$? **II.B.4.**
- A $y = -2x - 4$ B $y = -2x + 4$
 C $y = 2x - 4$ D $y = 2x + 4$
 E $y = -4x - 2$

14 **A** 



Name: _____

Date: _____

Test Practice

Sample Test 1 (continued)

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

15 What is the domain of the function shown in the table at the right? **II.A.2.**

- A $\{(-3, -15), (-1, -9), (0, -6), (2, 0), (4, 6)\}$
- B $\{(0, -6), (2, 0)\}$
- C $\{-15, -9, -6, -3, -1, 0, 2, 4, 6\}$
- D $\{-3, -1, 0, 2, 4\}$
- E $\{-15, -9, -6, 0, 6\}$

| x | y |
|----|-----|
| -3 | -15 |
| -1 | -9 |
| 0 | -6 |
| 2 | 0 |
| 4 | 6 |

15 **D**

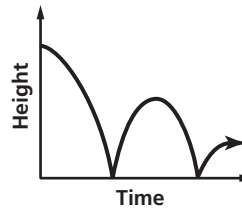
16 Which sentence represents the statement that a number minus 1 is less than the original number? **I.C.4.**

- A $-1 - 1 < 0$
- B $1 - 1 \leq 0$
- C $2 - 1 = 1$
- D $3 - 1 < 3$
- E $4 - 1 \leq 4$

16 **D**

17 Which situation best describes what is happening in the graph? **I.B.3.**

- A A skydiver jumps from a plane, free-falls, opens the parachute, then lands on the ground.
- B A group of hikers ascend and descend a mountain and several hills.
- C An airplane begins a descent, circles the airport, and lands.
- D A surfer rides a wave onto the shore.
- E A rubber ball is dropped from a window, hits the ground, and bounces up and down.



17 **E**

18 Deanna can pay \$2.50 each time she swims at the local pool, or she can buy a pass for \$10 and pay \$0.50 each time she swims. The spreadsheet shows the cost of each option. What is the most reasonable interpretation of the data in the spreadsheet? **II.D.3.**

| Visits | Pass | Pay Each Time |
|--------|---------|---------------|
| 1 | \$10.50 | \$2.50 |
| 2 | \$11.00 | \$5.00 |
| 3 | \$11.50 | \$7.50 |
| 4 | \$12.00 | \$10.00 |
| 5 | \$12.50 | \$12.50 |
| 6 | \$13.00 | \$15.00 |
| 7 | \$13.50 | \$17.50 |

- A Since the pass costs less overall, it is the better buy.
- B Since it clearly costs more to use a pass, it is better to pay \$2.50 each time.
- C The pass is a better buy if Deanna swims 5 times or more.
- D If Deanna swims 5 times or less, it is better to pay each time.
- E If Deanna swims 6 times or more, the pass is the better buy, and if she swims 4 times or less, it is better to pay each time.

18 **E**





Name: _____

Date: _____

Test Practice

Sample Test 1 (continued)

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 19 The matrix shows the number of students in each grade who bought tickets for the school dance. If advance tickets cost \$4 and tickets purchased at the door cost \$6, which matrix shows the total revenue from tickets for the dance? **I.C.6.**

| | 9th | 10th | 11th | 12th |
|-------------|-----|------|------|------|
| Advance | 35 | 44 | 56 | 82 |
| at the Door | 16 | 28 | 43 | 25 |

19 **A**

A $\begin{bmatrix} 140 & 176 & 224 & 328 \\ 96 & 168 & 258 & 150 \end{bmatrix}$

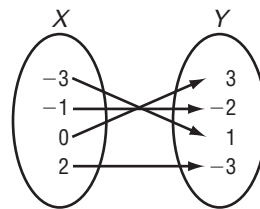
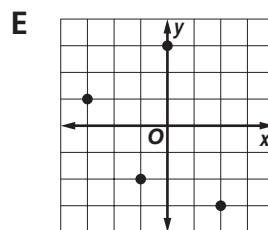
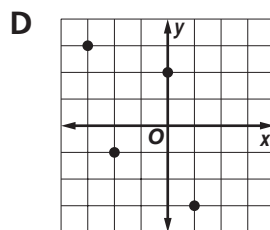
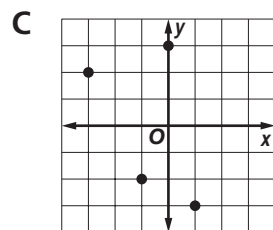
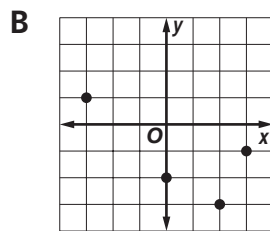
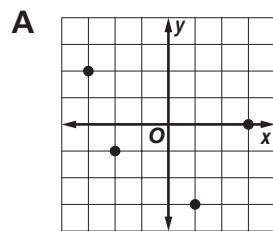
B $\begin{bmatrix} 210 & 264 & 336 & 492 \\ 64 & 112 & 172 & 100 \end{bmatrix}$

C $[236 \ 344 \ 482 \ 478]$

D $\begin{bmatrix} 868 \\ 672 \end{bmatrix}$

E $\begin{bmatrix} 96 & 168 & 258 & 150 \\ 140 & 176 & 224 & 328 \end{bmatrix}$

- 20 Which graph represents the relationship in the diagram? **I.A.4.**

20 **E** 

- 21 The formula $s = 5t^2 + 30t + 1000$ represents the average salary s of employees at Farm Products, Inc. over t years. Which is the dependent variable? **I.A.1.**

21 **D**

A 1000

B 30

C 5

D s E t 



Name: _____

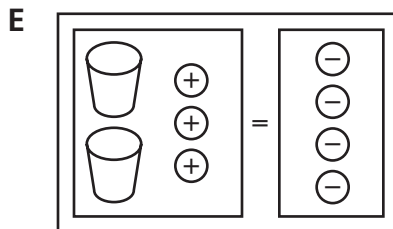
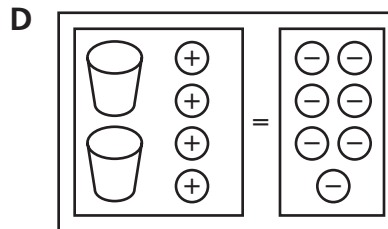
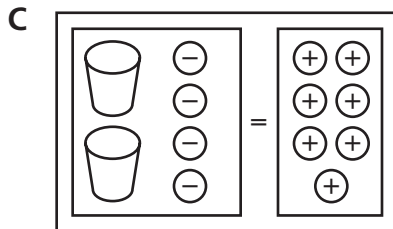
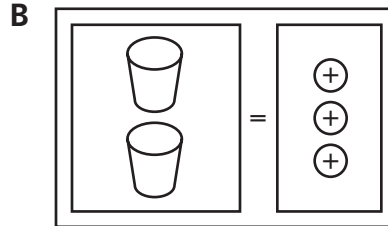
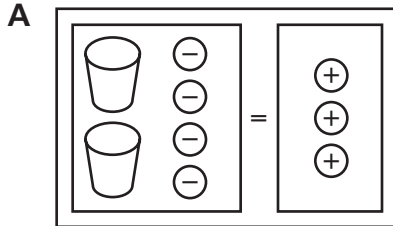
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Test Practice

Sample Test 1 (continued)

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 22 Which equation mat is modeling $2x + (-4) = 7$? **II.C.2.**

22 **C** 

- 23 Ms. Payton consulted a pool manual to find the rate at which she should drain her swimming pool. The manual recommends that she drain the pool at a rate of 2500 liters per hour, but Ms. Payton wants to know the rate in gallons per minute. If there are about 3.8 liters to a gallon, what is the rate in gallons per minute? **I.C.2.**

23 **C**

- A** about 660 gal/min **B** about 158 gal/min
C about 11 gal/min **D** about 3 gal/min
E about 0.2 gal/min

- 24 The time t that it takes Raymond to drive to work varies inversely as the rate at which he drives. If Raymond drives 14 miles to work at 40 miles per hour, which equation represents the situation? **III.B.2.**

24 **B**

- A** $t = \frac{40}{14}$ **B** $t = \frac{14}{40}$
C $t = 40(14)$ **D** $t = 40 - 14$
E $t = 40 + 14$



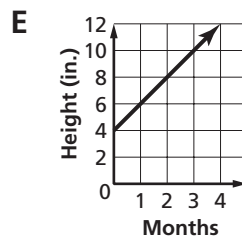
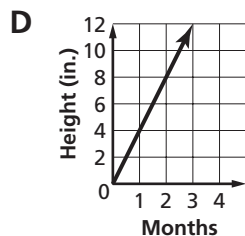
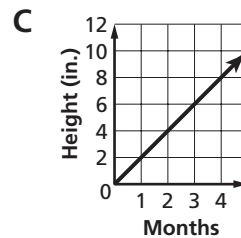
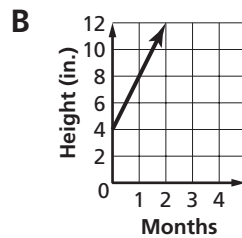
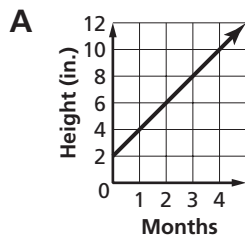


Test Practice

Sample Test 1 (continued)

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 25 Inez bought a 4-inch plant that grows at a rate of 2 inches per month to a maximum height of no more than 24 inches. Which model shows a reasonable number of months that it will take the plant to reach its full height? **II.C.4.**

25 **E** 

- 26 A packer at a manufacturing plant can box 10 packages of machine parts in an hour. The manager of the plant graphs the packer's output for a 30-hour workweek. Which statement about the graph is true? **I.B.2.**

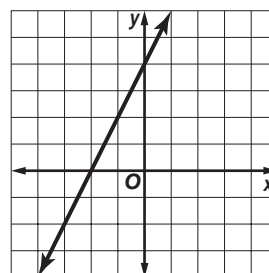
26 **D**

- A** The range is from 0 to 30 hours.
B The domain and range are both 0 to 30.
C The domain is from 0 to 300 boxes.
D The range is from 0 to 300 boxes.
E The domain cannot be greater than 10.

- 27 Which are the intercepts of the function represented on the graph? **II.B.5.**

27 **A**

- A** $(-2, 0)$, $(0, 4)$
B $(-2, 0)$, $(4, 0)$
C $(0, -2)$, $(0, 4)$
D $(2, 0)$, $(0, 4)$
E $(4, 0)$, $(0, -2)$





Name: _____

Date: _____

Test Practice

Sample Test 1 (continued)

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 28 Pickens County, South Carolina, has a population of 110,757, according to the 2000 Census. Its land area is 497 square miles. A reasonable estimate of the population density (persons per square mile) of Pickens County is
- A 2.2. B 22. C 220. **I.D.5.**
 D 2200. E 22,000.

28 **C**

- 29 What is the slope of the graph corresponding to the function in this table?

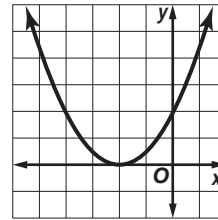
| | | | | | | |
|-----|-----|----|----|---|---|----|
| x | -3 | -2 | -1 | 0 | 1 | 2 |
| y | -11 | -6 | -1 | 4 | 9 | 14 |

- A 5 B 4 C 3
 D -4 E -5

II.B.1.29 **A**

- 30 The related function of $0.5x^2 + 2x = -2$ is graphed at the right. Which statement best describes the solution? **III.A.6.**

- A Since the graph does not cross the x -axis, there are no real roots, and so there is no solution.
 B Since the graph crosses the y -axis at $(0, 2)$, the solutions are 0 and 2.
 C There appears to be a double root at $(-2, 0)$, so the solutions are -2 and 0.
 D There appears to be a double root at $(-2, 0)$, so the solution is -2 .
 E There appears to be a double root at $(-2, 0)$, so the solution is the set of all real numbers.

30 **D**

- 31 Zoey is using a formula to determine whether the mass of the books she carries in her backpack could cause injury to her back. What unit of measure should Zoey use to find the mass of the books? **I.A.5.**

- A pounds B grams C kilograms
 D inches E centimeters

31 **C**

- 32 Which is the greatest value? **I.C.5.**

- A $\left(\frac{1}{4}\right)^2$ B 0.1^4 C 4×0.1
 D -0.4^2 E -0.1^2

32 **C** 



Test Practice

Sample Test 1 (continued)

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 33 Which polynomial expression is $5b(b + 6) + 3b$ in simplest form? **I.D.2.**

A $30b^2 + 15b$ B $15b^2 + 30b$
 C $5b^2 + 15b + 30$ D $5b^2 + 15b + 6$
 E $5b^2 + 33b$

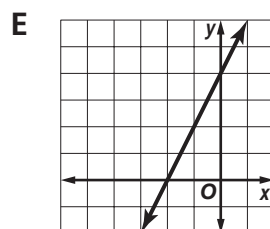
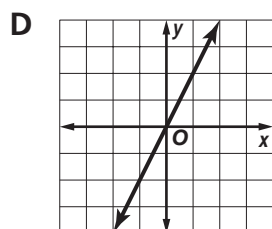
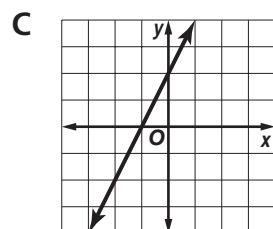
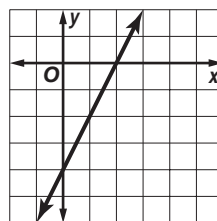
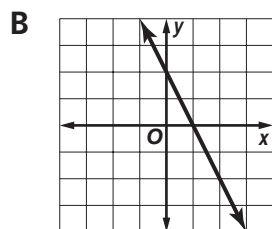
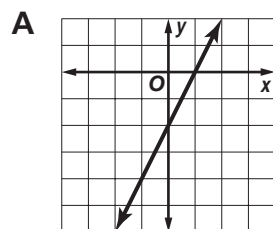
33 **E**

- 34 It costs Marc \$5 per day to rent a kayak plus \$10 for equipment at Outpost Outfitters. He can rent a kayak with equipment for \$7 per day at Back Country Outfitters. Which system of equations could Marc use to find the number of days at which the total cost to rent a kayak and equipment at both places is the same? Let c = the total cost and let d = days of rentals. **II.D.1.**

A $c = 5 + 10d$ B $c = 10 + 5d$
 $c = 7 + d$ C $c = 7d$
 C $c = 10 + 5d$ D $c = 5 + 10d$
 $c = 7 + d$ E $c = 5d + 7d$
 E $c = 5d + 7d$ $c = 10$

34 **B**

- 35 To the right is a graph of $y = mx - 4$. Which of these is a graph of $y = mx + 2$? **II.B.3.**

35 **C**

- 36 What is the range of $f(x) = 6x^2 - 4x + 5$ if the domain is $\{-2, -1, 2\}$? **III.A.1.**

A $\{-37, -15, 21\}$ B $\{-27, 7, 37\}$
 C $\{1, 3, 9\}$ D $\{37, 15, 21\}$
 E $\{37, -15, 21\}$

36 **D** 



Name: _____

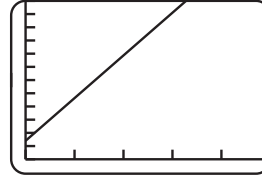
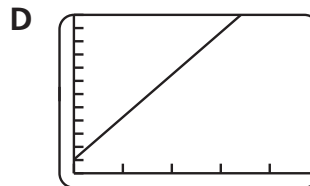
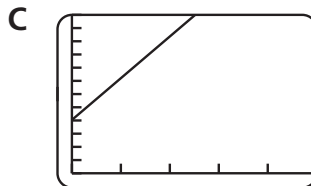
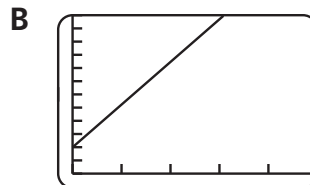
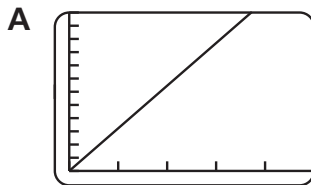
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Test Practice

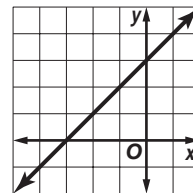
Sample Test 1 (continued)

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 37 The graphing calculator shows how much Interlock Data Services charges for data repair over the telephone. They charge a \$35 service processing fee plus \$80 an hour. Which graph shows the result of Interlock raising their processing fee to \$50? **II.B.6.**

37 **B** 

- 38 For which data set would this graph be a line of best fit? **I.B.5.**

38 **B**

A

| | | | | |
|----------|-----|----|-----|---|
| x | -2 | -1 | 0 | 1 |
| y | 1.5 | 2 | 3.5 | 4 |

B

| | | | | |
|----------|-----|----|---|---|
| x | -2 | -1 | 0 | 1 |
| y | 1.5 | 2 | 3 | 2 |

C

| | | | | |
|----------|----|-----|-----|---|
| x | -2 | -1 | 0 | 1 |
| y | 3 | 2.5 | 3.5 | 4 |

D

| | | | | |
|----------|----|-----|---|-----|
| x | -2 | -1 | 0 | 1 |
| y | 2 | 2.5 | 3 | 3.5 |

- 39 Which property justifies the following step?
 $14a(4b + 3) = 14a(4b) + 14a(3)$ **II.C.3.**

39 **E**

- A Reflexive Property of Equality
- B Substitution Property of Equality
- C Symmetric Property of Equality
- D Transitive Property of Equality
- E Distributive Property





Name: _____

Date: _____

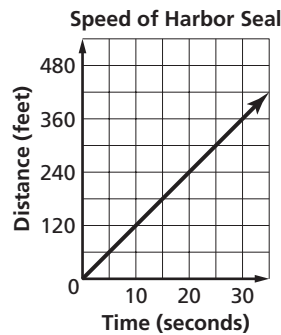
Test Practice

Sample Test 1 (continued)

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

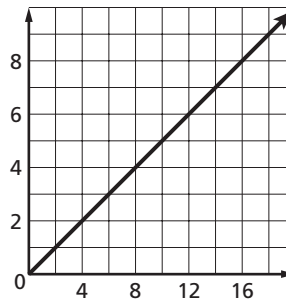
- 40 The graph shows the speed of a harbor seal as it swims along the coast. If the trend shown on the graph continues, how far will the seal have traveled in 40 seconds? **I.A.6.**

- A 360 ft
- B 400 ft
- C 420 ft
- D 480 ft
- E 540 ft

40 **D**

- 41 The linear function shown on the graph could represent: **II.A.1.**

- A the height of a hat tossed in the air when the home team wins.
- B the teaspoons of creamer used per cup of Joe's coffee.
- C the height of a tidal wave as it approaches the shore.
- D the time it takes a car to stop when the traffic light turns red.
- E the decay of a radioactive substance over time.

41 **B**

- 42 Erika used the spreadsheet below to solve $4x^2 - 12x + 5 = 0$. Which are the solutions of the equation? **III.A.5.**

| x | $4x^2$ | $-12x$ | 5 | $f(x)$ |
|-----|--------|--------|---|--------|
| 0 | 0 | 0 | 5 | 5 |
| 0.5 | 1 | -6 | 5 | 0 |
| 1 | 4 | -12 | 5 | -3 |
| 1.5 | 9 | -18 | 5 | -4 |
| 2 | 16 | -24 | 5 | -3 |
| 2.5 | 25 | -30 | 5 | 0 |
| 3 | 36 | -36 | 5 | 5 |

- A -30, 5
- B -6, 5
- C 0.5, 5
- D 0.5, 2.5
- E 2.5, 0

42 **D** 



Name: _____

Date: _____

Test Practice

Sample Test 1 (continued)

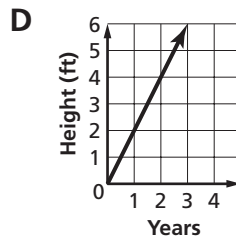
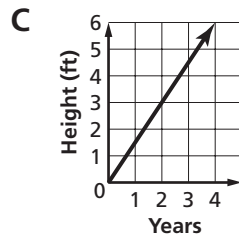
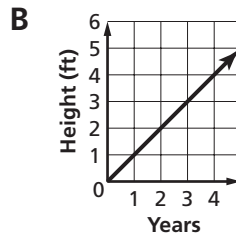
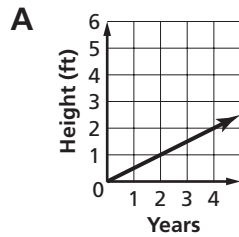
Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 43 The ratio of sea stars to sea anemones in a tide pool is 1 to 7. Which linear function relates the proportion of sea stars s to sea anemones a ?

A $s = 7a$ B $a = 7s$ C $a = \frac{1}{7}s$ II.B.7.
D $s + a = 7$ E $sa = 7$

43 B

- 44 The graphs show the rates of growth for four tupelo trees. Which tree is growing the slowest? II.B.2.

44 A

- 45 The stem-and-leaf plot displays the number of music requests made each day at a radio station over a three-week period. What is the median number of requests?

A 4 B 6 I.B.4.
C 10 D 11
E 33

| Music Requests | |
|----------------|-------------------|
| Stem | Leaf |
| 0 | 4 5 5 6 7 7 8 8 9 |
| 1 | 0 1 1 2 6 6 8 |
| 2 | 1 3 3 |
| 3 | 0 3 |

$$1|2 = 12$$

45 D

- 46 Which system of equations has no solution? II.D.2.

A $y = 3x + 2$ B $-3x + y = 2$
 $y = -2x - 3$ $2y = 6x + 4$
C $y = -3x + 2$ D $y = -3x - 2$
 $2y = -6x - 4$ $-2x - y = -4$
E $y = 3x - 2$
 $2x - y = 4$

46 C 



Name: _____

Date: _____

Test Practice

Sample Test 1 (continued)

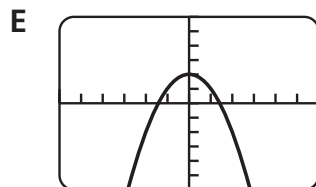
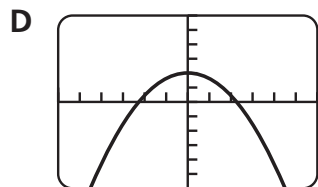
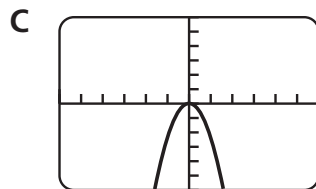
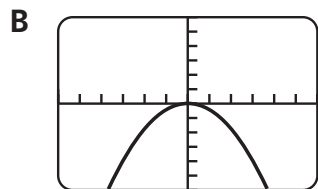
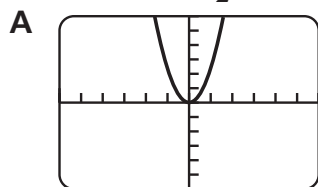
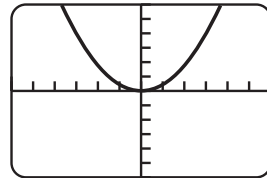
Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

47 Gerald plans to prepare steak picado for a dinner party of 25. He will use a recipe for 4. When Gerald shops for the ingredients of the recipe, his *best* choice would be to use **I.D.4.**

- A his calculator to figure approximate ingredients, and then round amounts to the nearest whole number.
- B paper-and-pencil to figure approximate amounts of ingredients and buy that amount.
- C mental math to get a rough estimate of ingredients and then double the estimate to be on the safe side.
- D a spreadsheet to convert the recipe for 25 so that he buys exactly what he needs.
- E a calculator or pencil-and-paper to convert the recipe and then round up the ingredients to ensure he has enough for 25 people.

47 **E**

48 The graphing calculator shows the graph of $y = \frac{2}{5}x^2$. Which screen shows the graph of $y = -\frac{5}{2}x^2$? **III.A.2.**

48 **C**

49 Which pattern shows how to find $(6^2)^3$? **III.B.1.**

- A $6 \times 6 \times 6 \times 6 \times 6$ or 6^5
- B $(6 \times 6)(6 \times 6)(6 \times 6)$ or 6^6
- C $(6 \times 2)(6 \times 2)(6 \times 2)$ or 12^3
- D $36 \times 36 \times 36$ or 36×3
- E $(12 \times 12)(12 \times 12)(12 \times 12)$ or 12^6

49 **B** 



Name: _____

Date: _____

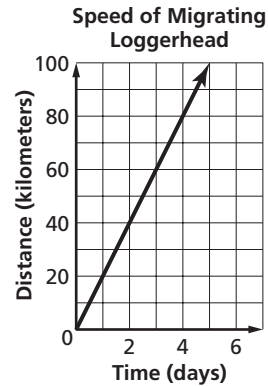
Test Practice

Sample Test 1 (continued)

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

50 The graph shows the average speed of a loggerhead turtle, migrating at an average rate of 20 kilometers per day. Which is true about the graph? **I.A.1.**

- A The number of days is the independent variable because the time it takes the loggerhead to migrate is not dependent on the distance it travels.
- B The distance the loggerhead turtle travels is the independent variable because distance is not dependent on how many days the turtle has been swimming.
- C The number of days it takes the loggerhead to migrate is the dependent variable because the turtle could swim faster or slower at times.
- D Both distance and time are dependent variables because sea conditions affect both the number of days it takes to migrate and the speed at which the loggerhead migrates.
- E Both distance and time are dependent variables because time and distance are interrelated.



50 **A**

51 Which situation *cannot* be represented by a linear function? **II.A.1.**

- A the cost of a breakfast buffet at \$5.65 per person
- B the distance a seahorse travels at one foot per minute
- C the height of a plant that grows a quarter-inch per week
- D the amount a family spends on groceries each week for a year
- E the population of a county with an annual growth rate of 2.3%

51 **E**

52 What is the solution of the system of equations shown below? **II.D.2.**

$$y = 2x + 5$$

$$3x - y = -4$$

- A (-1, -7)
- B (-1, 7)
- C (1, -7)
- D (1, 7)
- E (7, 1)

52 **D**





Name: _____

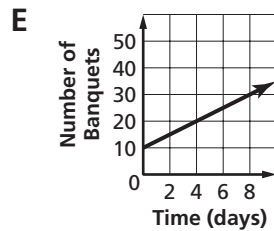
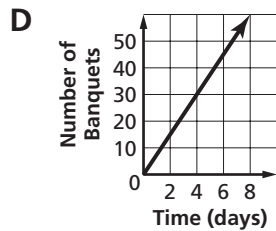
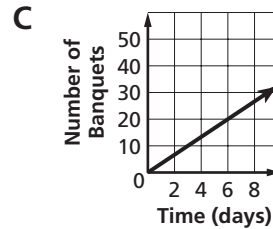
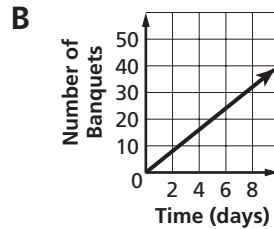
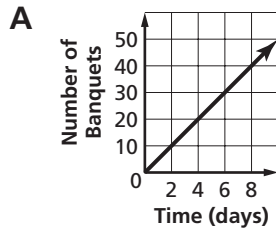
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Test Practice

Sample Test 1 (continued)

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 53 A catering service can prepare and serve 4 office banquets per day. Which graph represents the number of banquets prepared and served in a 10-day period? **I.B.2.**

53 **B**

- 54 The time t that it takes to complete a work order on a construction project varies inversely as the number of workers w assigned to the project. Which table shows the relationship between time and workers? **III.B.2.**

A

| | | | | |
|-----|----|----|----|----|
| w | 3 | 4 | 5 | 6 |
| t | 20 | 25 | 30 | 35 |

B

| | | | | |
|-----|----|----|---|---|
| w | 3 | 4 | 5 | 6 |
| t | 20 | 10 | 5 | 2 |

C

| | | | | |
|-----|----|----|----|----|
| w | 3 | 4 | 5 | 6 |
| t | 20 | 15 | 12 | 10 |

D

| | | | | |
|-----|----|----|----|----|
| w | 3 | 4 | 5 | 6 |
| t | 30 | 35 | 40 | 45 |

E

| | | | | |
|-----|----|----|----|----|
| w | 3 | 4 | 5 | 6 |
| t | 40 | 30 | 20 | 10 |

54 **C**

- 55 What is the value of $2c - 9 \div d^2$ if $c = 4$ and $d = -3$? **I.D.1.**

A 9

B 7

C $\frac{1}{9}$ D $-\frac{1}{9}$ E -3.75 55 **B**



Name: _____

Date: _____

Test Practice

Sample Test 1 (continued)

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 56 Which equation best fits the data in the table? **I.B.5.**

| | | | | | | |
|-----|-----|-----|-----|----|---|----|
| x | -2 | -1 | 0 | 1 | 2 | 3 |
| y | -33 | -24 | -15 | -6 | 3 | 12 |

- A $y = -9x - 15$
 B $y = -9x + 15$
 C $y = -3x - 15$
 D $y = 9x - 15$
 E $y = 9x + 15$

56 **D**

- 57 The Torrez family plans to rent a mountain bike, bicycles, and a jogger stroller for a week on vacation in Hilton Head Island. If they budget \$250 for equipment rentals, and they know a jogger stroller and mountain bike together will cost \$90, which statement can they use to determine how much they can spend on 3 regular bikes b ? **II.C.1.**

- A $3b - 90 \geq 250$
 B $3b + 90 > 250$
 C $3b + 90 \leq 250$
 D $3b - 90 < 250$
 E $3(b + 90) = 250$

57 **C**

- 58 Which statement best predicts the changes to the graph of $y = 3x^2$ when the coefficient of x^2 is changed to -1 ? **III.A.2.**

- A The graph becomes narrower and shifts down 1 unit.
 B The graph becomes narrower and opens downward rather than up.
 C The graph becomes narrower and shifts 1 unit to the left.
 D The graph becomes wider and opens downward rather than up.
 E The graph becomes wider, shifts down 1 unit, and opens up rather than downward.

58 **D**

- 59 Which best describes the rule for finding the next number in the pattern 56, 28, 14, 7, 3.5, ...? **I.C.3.**

- A Divide the previous number by $\frac{1}{2}$.
 B Multiply the previous number by $\frac{1}{2}$.
 C Write the next odd decimal.
 D Subtract twice the previous number.
 E Add twice the previous number.

59 **B** 



Name: _____

Date: _____

Test Practice

Sample Test 1 (continued)

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 60 Which situation *most likely* requires an exact answer? **I.D.4.**
- A Aimee wants to know the average number of meters she swam each day for a month.
 - B Ricardo wants to know if he has enough money to pay for 4 CDs at the music store.
 - C Tracie wants to know how much it will cost to replace the brakes on her car.
 - D A writer wants to know the cost of printing a manuscript so she can invoice the editor.
 - E A biologist wants to know how many birds in the preserve are tagged and banded each week.

60 **D**

Read each question and write your answer in the space provided. Be sure to show all your work.

- 61 In a seafood pasta dish, Ju-Yi noticed three mussels to every two scallops. Write an equation to represent the relationship between the number of mussels m and the number of scallops s . [2] **I.A.4.**

Sample answer: $m = \frac{3s}{2}$

- 62 Determine the intercepts of $y = 9x - 2$. [2] **II.B.5.**

$(0, -2), (\frac{2}{9}, 0)$

- 63 Some domestic dogs can reach speeds up to 32 kilometers per hour when they are running hard. Leslie says that since there are about 3281 feet in a kilometer, that a domestic dog can run about 1750 feet in a minute. Use unit analysis to check Leslie's computation. If Leslie is incorrect, give the correct speed in feet per minute. [3] **I.C.2.**

$$\frac{32 \text{ km}}{1 \text{ hr}} \cdot \frac{3281 \text{ ft}}{1 \text{ km}} \cdot \frac{1 \text{ hr}}{60 \text{ min}} = \frac{32 \cdot 3281 \text{ ft}}{60 \text{ min}} = \frac{104,992 \text{ ft}}{60 \text{ min}} \approx 1750 \text{ ft/min.}$$

Leslie's computation is correct.

- 64 What is the domain and range of $f(x) = 49 - x^2$? [2] **III.A.1.**

The domain is all real numbers.

The range is $f(x) \leq 49$.





Name: _____

Date: _____

Test Practice

Sample Test 1 (continued)

Read each question and write your answer in the space provided. Be sure to show all your work.

- 65 Simplify $-3(4x - 4) + 2(x - 6)$. Show the steps and the properties you used to simplify the expression. [4] **I.D.6.**

-10x; Sample answer:

$$-3(4x - 4) + 2(x - 6)$$

$$= -3(4x) + (-3)(-4) + 2(x) + 2(-6) \quad \text{Distributive Property}$$

$$= -12x + 12 + 2x + (-12) \quad \text{Multiply.}$$

$$= -12x + 2x + 12 + (-12) \quad \text{Commutative Property of Addition}$$

$$= (-12x + 2x) + [12 + (-12)] \quad \text{Associative Property of Addition}$$

$$= (-10x) + [0] \quad \text{Add.}$$

$$= -10x \quad \text{Additive Identity}$$

- 66 Complete the table for $y = -4x + 2$. [3] **II.A.3.**

| | | | | | | |
|----------|----|----|----------|-----------|-----------|------------|
| x | -2 | -1 | 0 | 1 | 2 | 3 |
| y | 10 | 6 | 2 | -2 | -6 | -10 |

- 67 Simplify and solve the following inequality, using any method. Show the method you used to solve the problem. Then represent the solution on the number line provided. [3] **II.C.2.**



$$-7 + 2x + 3 < 4x - 9 + 3x$$

Sample answer:

$$-7 + 2x + 3 < 4x - 9 + 3x$$

$$-4 + 2x < 7x - 9$$

$$-4 + 2x - 7x < -9$$

$$-4 - 5x < -9$$

$$-5x < -5$$

$$x > 1$$





Name:

Date:

Test Practice

Sample Test 1 (continued)

Read each question and write your answer in the space provided. Be sure to show all your work.

- 68 Justine says that if you square any given value of x , the square of x will always be greater than the value of x . State whether you agree or disagree with Justine's claim. If you disagree, write a counterexample. [2] **I.C.5.**

Disagree; sample answer: If x is $\frac{1}{8}$ and you square $\frac{1}{8}$, the result is $\frac{1}{64}$. Since $\frac{1}{64}$ is less than $\frac{1}{8}$, Justine's statement is false.

- 69 Find $7x^3y(-4x^3 - xy + 2y)$. [1] **I.D.2.**

$$-28x^6y - 7x^4y^2 + 14x^3y^2$$

- 70 Use the Quadratic Formula to solve $2x^2 - 8x - 6 = 0$. Round to the nearest tenth, if necessary. Show the steps you used to solve the problem. [3] **III.A.5.**

$$\begin{aligned} \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} &= \frac{8 \pm \sqrt{(-8)^2 - 4(2)(-6)}}{2(2)} \\ &= \frac{8 \pm \sqrt{64 - (-48)}}{4} \text{ or } \frac{8 \pm \sqrt{112}}{4} \text{ or } \frac{8 \pm 4\sqrt{7}}{4} \text{ or } 2 \pm \sqrt{7} \\ &= 2 + \sqrt{7} \text{ or } \approx 4.6 \\ &= 2 - \sqrt{7} \text{ or } \approx -0.6 \end{aligned}$$

- 71 Determine whether the data in the table below display exponential behavior. Explain your reasoning. [3] **III.B.3.**

| | | | | | |
|-----|---|---|-----|------|--------|
| x | 3 | 6 | 9 | 12 | 15 |
| y | 2 | 3 | 4.5 | 6.75 | 10.125 |

Yes; sample answer: The domain values are at regular intervals and the range values have a common factor of 1.5. This means that the data are probably exponential.





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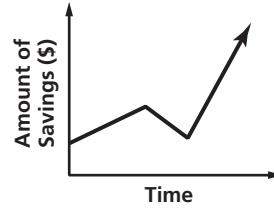
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Test Practice

Sample Test 1 (continued)

Read each question and write your answer in the space provided. Be sure to show all your work.

- 72 The graph represents Chiavo's savings account over several years. Describe what is happening in the graph. [3] **I.B.3.**



Sample answer: Chiavo opens the account with a deposit. His savings grow slowly either from interest or more deposits. He then withdraws some money from the account. After that, he deposits more money into the account and it continues to grow at a faster rate than earlier.

- 73 Predict the effect(s) on the graph of $y = 9x^2 - 2$ when the graph is translated up 3 units. [1] **III.A.3.**

Sample answer: The vertex of the graph will change from $(0, -2)$ to $(0, 1)$.

- 74 Mr. Watson took a science class on a field trip to Riverbanks Zoo and Botanical Gardens in Columbia. Admission for a group of 4 adult chaperones and 15 students cost \$81. Admission for a second group of 6 adult chaperones and 20 students cost \$117.50. Write a system of equations you could use to find the price of a ticket for an adult and the price of a ticket for a student. Identify variables. Do not solve the problem. [3] **II.D.1.**

Sample answer: Let a = cost of adult ticket and let s = cost of student ticket.

$$4a + 15s = 81$$

$$6a + 20s = 117.5$$

- 75 A boat repair shop in Beaufort charges \$60 to power wash the bottom of a 60-foot vessel and then \$2 for each additional foot up to 80 feet. They make a graph to show their charges for 1 to 30 additional feet. If they decide to offer a special of \$1.50 for each additional foot, describe in words how their graph will change and how it will remain the same. [4] **II.B.6.**

Sample answer: The slope of the graph will change from 2 to 1.5, but the y-intercept will remain the same at \$60.





Name: _____

Date: _____

Test Practice

Sample Test 1 (continued)

Read each question and write your answer in the space provided. Be sure to show all your work.

- 76** For next week's chemistry experiment, Ms. Purdy needs 3 test tubes for every 2 students. Write an equation for the situation and explain how Ms. Purdy could use it to determine how many test tubes she will need for the 116 students in her 5 chemistry classes. [4] **I.A.3.**

Sample answer: She could use the equation $t = \frac{3}{2}s$, where t is the number of test tubes and s is the number of students, and substitute 116 for s to determine the total number of test tubes she needs for the experiment.

- 77** Lance used the equation $y = 2.5x + 30$ to graph the cost to print posters for an upcoming 1950s car parade. The variable x represents the number of posters in this equation. What does the equation mean in terms of slope and y -intercept? [4] **II.B.2.**

Sample answer: The slope of the graph is 2.5, which means that it costs \$2.50 to print each poster, or that the rate of increase is \$2.50. The y -intercept of the graph is 30, which means that costs start at \$30 to print the posters.

- 78** Describe in words how the graph of $f(x) = -12x + 5$ is similar to and different from the graph of $g(x) = -10x + 5$. [3] **II.B.3.**

Sample answer: They are similar in that both graphs intercept the y -axis at 5. They are different in that the slope of f is -12 and the slope of g is -10 .

- 79** In an annual inventory of amphibians inhabiting a nature preserve, a biologist spotted 42 frogs and 12 toads in one area of the preserve. If the proportion of frogs to toads is typical of the whole preserve, how many frogs should she expect to see in an adjacent area if she counted 2 toads? [2] **II.B.7.**

She should expect to see 7 frogs.

- 80** The area of a rectangle is $24x^8y^4$ square units. The width is $6x^3y^2$. What is the length of the rectangle? [2] **III.B.1.**

$4x^5y^2$





Name: _____

Date: _____

Test Practice

Sample Test 2 (continued)

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 5 Bert and Pam Wilkins began extensive renovations to their \$90,000 house in 1998. The house has been appreciating at a rate of 25% per year. Which spreadsheet gives the value of the house in 2002, rounded to the nearest dollar? **III.B.3.**

5 **B**

A

| 1 | A | B |
|---|------|--------|
| 2 | 1998 | 90,000 |
| 3 | 1999 | 92,250 |
| 4 | 2000 | 94,556 |
| 5 | 2001 | 96,920 |
| 6 | 2002 | 99,343 |

B

| 1 | A | B |
|---|------|---------|
| 2 | 1998 | 90,000 |
| 3 | 1999 | 112,500 |
| 4 | 2000 | 140,625 |
| 5 | 2001 | 175,781 |
| 6 | 2002 | 219,727 |

C

| 1 | A | B |
|---|------|------------|
| 2 | 1998 | 90,000 |
| 3 | 1999 | 11,250,000 |
| 4 | 2000 | 11,531,250 |
| 5 | 2001 | 11,819,531 |
| 6 | 2002 | 12,115,020 |

D

| 1 | A | B |
|---|------|--------|
| 2 | 1998 | 90,000 |
| 3 | 1999 | 67,500 |
| 4 | 2000 | 50,625 |
| 5 | 2001 | 37,969 |
| 6 | 2002 | 28,477 |

- 6 Which inequality is the solution of $-4x - 3 > 13$? **I.D.3.**

6 **E**

- A** $x > -4$ **B** $x > -2.5$
C $x > 4$ **D** $x < -2.5$
E $x < -4$

- 7 A summer volleyball camp costs \$40 per day plus a one-time fee of \$10 for refreshments. Which equation should Lora use to find how much it would cost c to attend the camp for anywhere between 3 and 8 days d ? **II.C.1.**

7 **A**

- A** $c = 40d + 10$
B $c = 40d - 10$
C $c = 40(d + 10)$
D $d = 40(c + 10)$
E $d = 40c + 10$

- 8 Which situation can be represented by a linear function? **II.A.1.**

8 **D**

- A** the time it takes a firework to reach its maximum height
B the value of a tractor that depreciates 15% each year
C the height of a tree that doubles in height every two years
D the number of monthly violin lessons at a twice-a-week rate
E the distance a soccer ball travels when kicked at an initial speed of 93 feet per second





Name: _____

Date: _____

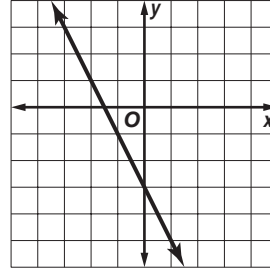
Test Practice

Sample Test 2 (continued)

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

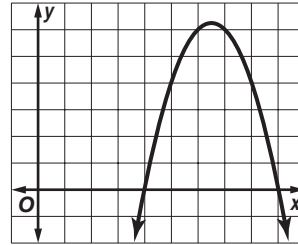
- 9 Which equation describes the graph? **I.B.1.**

- A $y = 1.5x - 3$
 B $y = 2x - 3$
 C $y = -1.5x - 3$
 D $y = -x - 3$
 E $y = -2x - 3$

9 **E**

- 10 The graph of $f(x) = -x^2 + 13x - 36$ can be used to find two numbers whose sum is 13 and whose product is 36. What can you conclude from the graph? **III.A.4.**

- A Since (6, 6) and (7, 6) are on either side of the maximum, the numbers are 6 and 7.
 B The vertex shows that one number is slightly more than 6 and the other is unknown.
 C The axis of symmetry shows that both numbers are 6.5.
 D The zeros of the function show that the numbers are both between 4 and 9.
 E The zeros of the function show that the numbers are 4 and 9.

10 **E**

- 11 Which expression do you obtain if you simplify $2a(4a + 2b - 3)$? **I.D.6.**

- A $2a + 4ab$
 B $2a^2 + 4ab$
 C $8a^2b^2 - 6a$
 D $8a^2 + 4ab - 6a$
 E $8a^2 + 4b - 6$

11 **D**

- 12 What is the range of $f(x) = -4x + 2$ for $D = \{-3, 2, 4\}$? **II.A.2.**

- A $\{14, -6, -14\}$
 B $\{-14, 6, 14\}$
 C $\{-10, 10, 18\}$
 D $\{-6\}$
 E $\{10, -10, -18\}$

12 **A**

- 13 Which of these is an equation of the line with a slope of -4 and passing through $(2, -5)$? **II.B.4.**

- A $y = -4x + 2$
 B $y = -4x - 5$
 C $y = -4x + 3$
 D $y = -\frac{1}{2}x - 5$
 E $y = -\frac{1}{2}x + 2$

13 **C** 



Name: _____

Date: _____

Test Practice

Sample Test 2 (continued)

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 14 Twice a number minus three is no more than that number plus two. In the models shown, white tiles represent the unknown number, white chips the number 1 and shaded chips -1 . Which model represents a reasonable solution of the inequality? **II.C.4.**

A $\square\square\bigcirc\bigcirc\bigcirc \leq \square\bigcirc\bigcirc$
 $\boxed{\square}\boxed{\square}\boxed{\bigcirc}\boxed{\bigcirc}\boxed{\bigcirc} \leq \boxed{\square}\bigcirc\bigcirc\bigcirc\bigcirc\bigcirc$
 $\square \leq \bigcirc\bigcirc\bigcirc\bigcirc\bigcirc$

B $\square\square\bigcirc\bigcirc\bigcirc \leq \bigcirc\bigcirc$
 $\boxed{\square}\boxed{\square}\boxed{\bigcirc}\boxed{\bigcirc}\boxed{\bigcirc} \leq \boxed{\bigcirc}\boxed{\bigcirc}\bigcirc\bigcirc\bigcirc$
 $\square \leq \bigcirc\bigcirc\bigcirc$

C $\square\square\bigcirc\bigcirc\bigcirc \leq \bigcirc\bigcirc$
 $\boxed{\square}\boxed{\square}\boxed{\bigcirc}\boxed{\bigcirc}\boxed{\bigcirc} \leq \boxed{\bigcirc}\boxed{\bigcirc}$
 $\square \leq \bigcirc$

D $\square\square\bigcirc\bigcirc\bigcirc \leq \square\bigcirc\bigcirc$
 $\boxed{\square}\boxed{\square}\boxed{\bigcirc}\boxed{\bigcirc}\boxed{\bigcirc} \leq \boxed{\square}\bigcirc\bigcirc\bigcirc\bigcirc\bigcirc$
 $\square \leq \bigcirc\bigcirc\bigcirc\bigcirc\bigcirc$

14 **A**

- 15 Which data table corresponds to $y = -3x + 1$? **I.A.2.**

A

| | | | | |
|---|----|---|---|---|
| x | -1 | 0 | 1 | 2 |
| y | -4 | 1 | 4 | 7 |

B

| | | | | |
|---|----|---|---|---|
| x | -1 | 0 | 1 | 2 |
| y | -2 | 1 | 4 | 7 |

C

| | | | | |
|---|----|---|---|---|
| x | -1 | 0 | 1 | 2 |
| y | -2 | 1 | 2 | 7 |

D

| | | | | |
|---|----|---|----|----|
| x | -1 | 0 | 1 | 2 |
| y | 4 | 1 | -3 | -6 |

E

| | | | | |
|---|----|---|----|----|
| x | -1 | 0 | 1 | 2 |
| y | 4 | 1 | -2 | -5 |

15 **E**

- 16 Which numbers are counterexamples for the statement below? **I.C.4.**

If the product $x \cdot y$ is even, then both x and y are even.

- A $x = -4, y = -6$ B $x = -1, y = -3$ C $x = 2, y = 4$
 D $x = 3, y = 7$ E $x = 5, y = 4$

16 **E**

- 17 Which pattern can be used to simplify $\frac{9^6}{9^4}$? **III.B.1.**

A $\frac{(9 \cdot 9)(9 \cdot 9)(9 \cdot 9)(9 \cdot 9)(9 \cdot 9)(9 \cdot 9)}{(9 \cdot 9)(9 \cdot 9)(9 \cdot 9)(9 \cdot 9)}$ or 81^2 .

B $\frac{9 \cdot 9 \cdot 9 \cdot 9 \cdot 9 \cdot 9}{9 \cdot 9 \cdot 9 \cdot 9}$ or 9^2 .

C $9 \cdot 9 \cdot 9 \cdot 9 \cdot 9 \cdot 9 \cdot 9 \cdot 9 \cdot 9 \cdot 9$ or 9^{10}

D $(9 \cdot 9)(9 \cdot 9)(9 \cdot 9)(9 \cdot 9)(9 \cdot 9)(9 \cdot 9)(9 \cdot 9)(9 \cdot 9)(9 \cdot 9)(9 \cdot 9)$
 or 81^{10}

E $(9 \cdot 6)(9 \cdot 4)$ or 9^{24}

17 **B** 



Name: _____

Date: _____

Test Practice

Sample Test 2 (continued)

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 18 The Emmetts launch a canoe from the riverbank and start paddling at 2 miles per hour. The Hundley's launch their canoe 30 minutes later and start paddling at 3 miles per hour. How long will it take the Hundley's to catch up with the Emmetts? **II.D.3.**

A 15 min B 30 min C 45 min
D 1 hr E 1.5 hr

18 **D**

- 19 The matrix shows the number of male and female students in grades 9, 10, 11, and 12 who signed up for the astronomy club. The number of 9th grade females who joined the club are in row 2, column 1. How many 11th grade females joined the club? **I.C.6.**

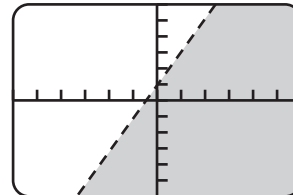
$$\begin{bmatrix} 3 & 1 & 5 & 8 \\ 2 & 4 & 3 & 5 \end{bmatrix}$$

A 1 B 2 C 3
D 4 E 5

19 **C**

- 20 Which graph is shown on the graphing calculator screen? **I.A.4.**

A $y < 2x + 1$ B $y \leq 2x + 1$
C $y > 2x + 1$ D $y \geq -2x + 1$
E $y < -2x + 1$

20 **A**

- 21 Which table corresponds to $b = 6t + 5$? **II.A.3.**

A

| | | | | |
|----------|----|----|---|----|
| <i>t</i> | -2 | -1 | 0 | 1 |
| <i>b</i> | 17 | 11 | 5 | -1 |

B

| | | | | |
|----------|-----|-----|---|----|
| <i>t</i> | -2 | -1 | 0 | 1 |
| <i>b</i> | -17 | -11 | 5 | 11 |

C

| | | | | |
|----------|----|----|---|---|
| <i>t</i> | -2 | -1 | 0 | 1 |
| <i>b</i> | -7 | -1 | 5 | 6 |

D

| | | | | |
|----------|----|----|---|----|
| <i>t</i> | -2 | -1 | 0 | 1 |
| <i>b</i> | -7 | -1 | 5 | 11 |

E

| | | | | |
|----------|----|----|---|---|
| <i>t</i> | -2 | -1 | 0 | 1 |
| <i>b</i> | -5 | 1 | 5 | 9 |

21 **D**

- 22 What does this number line represent? **II.C.2.**



A $3 < x \leq 8$ B $3 < x < 8$ C $3 \leq x < 8$
D $3 > x \geq 8$ E $3 \geq x > 8$

22 **C** 



Name: _____

Date: _____

Test Practice

Sample Test 2 (continued)

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 23 Miriam estimates that the Spanish moss on a tree in her backyard grows at a rate of one-half inch per month. Which shows the correct expression Miriam should use to convert the growth to centimeters per year? **I.C.2.**

A $\frac{0.5 \text{ in.}}{1 \text{ mo}} \cdot \frac{2.54 \text{ cm}}{1 \text{ in.}} \cdot \frac{12 \text{ mo}}{1 \text{ yr}}$

B $\frac{1 \text{ yr}}{0.5 \text{ in.}} \cdot \frac{2.54 \text{ cm}}{1 \text{ in.}} \cdot \frac{12 \text{ mo}}{1 \text{ mo}}$

C $\frac{1 \text{ in.}}{1 \text{ mo}} \cdot \frac{0.5 \text{ in.}}{2.54 \text{ cm}} \cdot \frac{12 \text{ mo}}{1 \text{ yr}}$

D $\frac{0.5 \text{ in.}}{1 \text{ mo}} \cdot \frac{1 \text{ in.}}{2.54 \text{ cm}} \cdot \frac{12 \text{ mo}}{1 \text{ yr}}$

E $\frac{0.5 \text{ in.}}{1 \text{ mo}} \cdot \frac{2.54 \text{ cm}}{1 \text{ in.}} \cdot \frac{1 \text{ yr}}{12 \text{ mo}}$

23 **A**

- 24 The spreadsheet shows the lengths and widths of a rectangle with a fixed area of 120 square meters. Which statement about this relationship is true?

- A The constant of variation is 60.
 B Width varies inversely as length.
 C Width varies inversely as the area of the rectangle.
 D Length varies inversely as the area of the rectangle. **III.B.2.**
 E Area varies inversely as length and width.

| | A | B |
|---|---------------|-----------|
| 1 | Length ℓ | Width w |
| 2 | 2 | 60 |
| 3 | 4 | 30 |
| 4 | 6 | 20 |
| 5 | 8 | 15 |
| 6 | 10 | 12 |
| 7 | 12 | 10 |

24 **B**

- 25 What is the value of $f(x) = -x^2 + 2x + 5$ for $f(-2)$? **I.D.1.**

- A -3
 B -1
 C 4
 D 5
 E 11

25 **A**

- 26 A charter boat captain graphs the number of clients he takes fishing each day in June. If the captain charts a full boat of 20 clients every day of the week, what is a reasonable statement about the graph? **I.B.2.**

- A The domain is from 0 to 100.
 B The domain and range are both from 0 to 20.
 C The range is from 0 to 600.
 D The range is less than the domain.
 E The domain is half of the range.

26 **C** 



Name: _____

Date: _____

Test Practice

Sample Test 2 (continued)

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

27 Which are the intercepts of $y = -14x - 7$? **II.B.5.**

- A $(-2, 0), (0, -7)$ B $(-\frac{1}{2}, 0), (0, -7)$
 C $(\frac{1}{2}, 0), (0, -7)$ D $(0, \frac{1}{2}), (-7, 0)$
 E $(2, 0), (0, -7)$

27 **B**

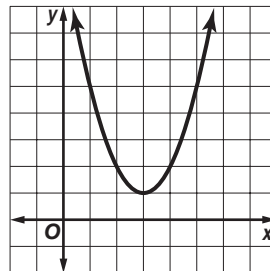
28 Annalise used the Quadratic Formula to solve $3x^2 + 2x = 3$. Which method would *best* confirm her solution? **I.D.5.**

- A working the problem a second time
 B using the discriminant to determine the number of real roots
 C checking to see if correct numbers were substituted in the formula
 D checking the solutions on a graphing calculator to determine the zeros of the related function
 E using another method such as factoring or completing the square

28 **D**

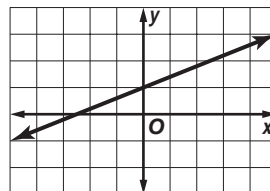
29 What are the root(s) of the quadratic equation whose function is graphed at the right? **III.A.6.**

- A 10
 B 3, 1
 C 3
 D 0
 E There are no real roots.

29 **E**

30 What is the slope of the graph? **II.B.1.**

- A 5 B $\frac{5}{2}$
 C 2 D $\frac{2}{5}$
 E 1

30 **D**

31 Corey plans to go fishing with three of his friends. He figures that they will spend at least \$80 on the trip, including 4 fishing licenses and \$60 for bait and lures. Which inequality describes the situation? **I.A.3.**

- A $4f - 60 \leq 80$ B $4f + 60 \leq 80$
 C $4f - 60 \geq 80$ D $4f + 60 \geq 80$
 E $4f + 80 \geq 60$

31 **D** 



Name: _____

Date: _____

Test Practice

Sample Test 2 (continued)

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

32 Which statement is true? **I.C.5.**

- A The difference between two positive integers is always positive.
- B The sum of two negative integers is always positive.
- C The product of two negative integers is always negative.
- D The dividend of a positive quotient is always positive.
- E The quotient of two negative integers is always positive.

32 **E**

33 Gabrielle makes and sells wind chimes out of her home. She had \$300 in start-up costs and it costs \$15 to produce each wind chime x . She sells the wind chimes for \$30 each. Which system of equations can Gabrielle use to find the break-even point for her business? **II.D.1.**

- A $y = 300 + 30x$
 $y = 15x$
- B $y = 300 - 30x$
 $y = 15x$
- C $y = 300 + 15x$
 $y = 30x$
- D $y = 300 + 15x$
 $y = 30 + x$
- E $y = 300 - 15x$
 $y = 30x$

33 **C**

34 If you subtract $(9y^2 + 3y - 6)$ from $(12y^2 - 7y - 8)$, the difference is

- A $-3y^2 - 10y - 14$.
- B $-3y^2 + 10y + 2$.
- C $3y^2 - 4y - 14$.
- D $3y^2 - 10y - 2$.
- E $3y^2 - 10y + 2$.

I.D.2.

34 **D**

35 Raoul walks 1.5 miles one way to and from school each day. What is the round-trip distance in kilometers? **I.A.5.**

- A about 4800 km
- B about 4.8 km
- C about 2.4 km
- D about 1.8 km
- E about 0.9 km

35 **B**





Name: _____

Date: _____

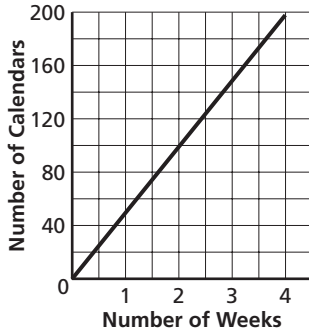
Test Practice

Sample Test 2 (continued)

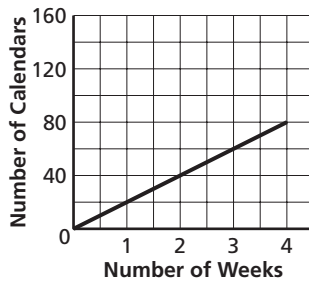
Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 36 The Environmental Club at Southern Hills High School made a graph of the number of calendars they sold the first month of their annual fund raiser.

36 **B**



In the second month, the graph looked like this.



What has changed? **II.B.6.**

- A They sold 30 more calendars the second month than they did the first month.
- B They sold 30 fewer calendars each week.
- C They sold 30 more calendars each week.
- D The sales price of the calendar has been increased by \$30.
- E The sales price of the calendar is now \$30 each.

- 37 A park service charges \$135 to rent a cabin for 3 days. They charge \$315 for 7 days, and \$450 for 10 days. Which function represents the relationship between the number of days d that a cabin is rented and the total cost c to rent the cabin? **I.C.3.**

37 **C**

- A $d = 45c$
- B $d = 45 + c$
- C $c = 45d$
- D $c = 45 + d$
- E $c = 3(d - 135)$

- 38 What is the range of $f(x) = -3x^2 + 12x - 4$ for $f(3)$? **III.A.1.**

38 **E**

- A 59
- B 35
- C 23
- D 17
- E 5





Name: _____

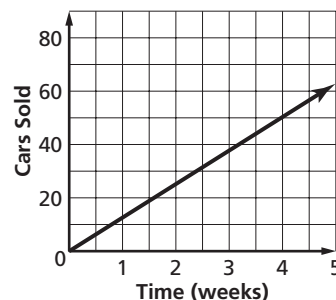
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Test Practice

Sample Test 2 (continued)

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 39 Which property justifies the step when you write $13b > 39$ as $b > 3$? **39** **B**
- A Subtraction Property of Inequalities **II.C.3.**
B Division Property of Inequalities
C Multiplicative Identity
D Substitution Property of Equality
E Commutative Property of Multiplication
- 40 Mr. Tomlinson uses the formula $a_n = 12n - 2$ to assign the number of math problems for homework each week of class for the semester. During which week were students first assigned more than 60 problems for the week? **40** **C**
- A week 4
B week 5
C week 6
D week 7
E week 8
- 41 The value of a is 13 when b is 10, and a is 26 when b is 20. Which relates a and b ? **41** **E**
- A $a = \frac{10}{13b}$
B $\frac{a}{b} = \frac{10}{13}$
C $ab = 130$
D $a = 13b$
E $a = 1.3b$
- 42 The graph models the number of cars a salesman sold over the past 5 weeks. Based on the graph, how many cars should he expect to sell in 6 weeks? **42** **C**
- A 50
B 60
C 75
D 150
E 300





Name: _____

Date: _____

Test Practice

Sample Test 2 (continued)

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

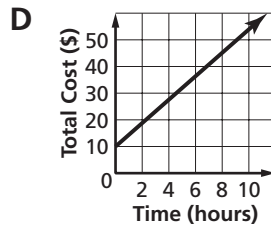
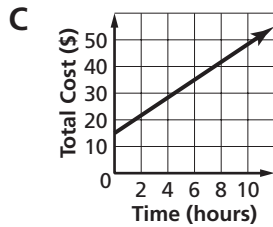
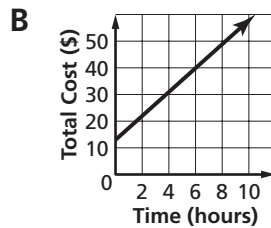
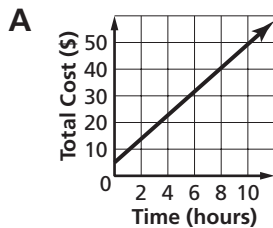
43 If you use factoring to solve $x^2 + 9x = -20$, which are the solutions?

- A -5, -4
- B -5, 4
- C -5, -2
- D -2, 5
- E 4, 5

III.A.5.

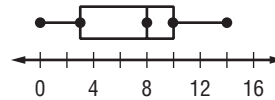
43 A

44 The graphs show the costs of four canoe outfitters on the Black River. The outfitters charge a minimum fee to rent a canoe in addition to a rental charge for each hour. Which graph shows a minimum fee of \$10? II.B.2.



44 D

45 The box-and-whisker plot represents last season's basketball scores at Hillsborough High School. The greatest range of scores is in which part of the data? I.B.4.



- A lower 25%
- B upper 25%
- C lower 50%
- D middle 50%
- E upper 50%

45 C





Name: _____

Date: _____

Test Practice

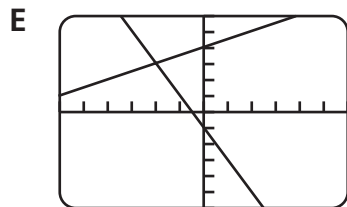
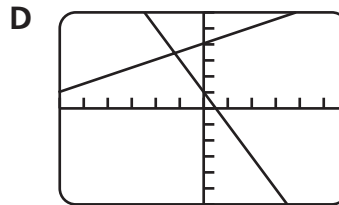
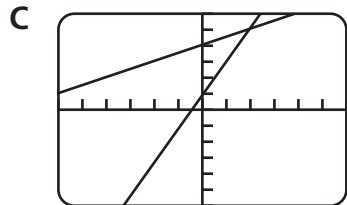
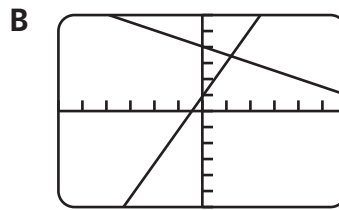
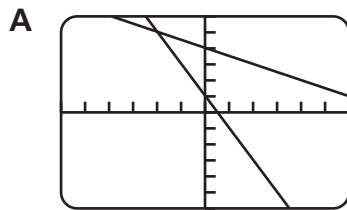
Sample Test 2 (continued)

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 46 Which graphing calculator screen shows the solution of the system of equations below? **II.D.2.**

$$y = -0.5x + 4$$

$$y = 2x + 1$$

46 **B**

- 47 Sergio owns a small seafood restaurant. The number of customers has recently increased and he wants to know how many new waiters he should hire. His *best* option would be to use **I.D.4.**

- A mental math to roughly estimate the increase in customers and hire new waiters based on the rough estimate.
- B a spreadsheet to tabulate receipts so that he can better judge the increase in business and then hire new waiters based on his judgment.
- C paper-and-pencil to tally the number of customers during different periods of the day, and then use this approximation to hire new waiters.
- D a graphing calculator to graph a function that will tell him the number of waiters he should hire to maximize profits.
- E paper-and-pencil to tally customer and waiter complaints, and then use a calculator to find the exact ratio between satisfied customers and satisfied waiters and hire waiters based on the ratio.

47 **C** 



Name: _____

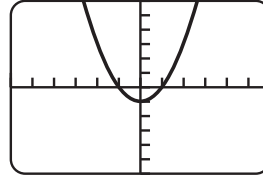
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Test Practice

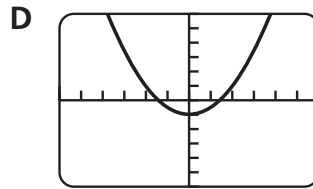
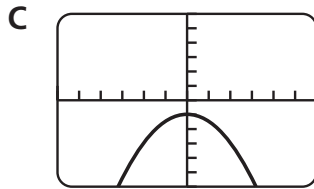
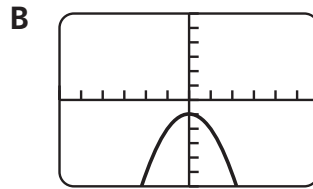
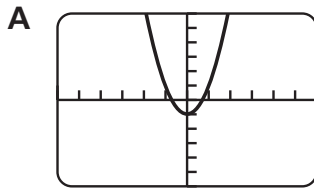
Sample Test 2 (continued)

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 48 The graph of $y = ax^2 + k$ is shown on the graphing calculator. Which of the following screens shows the graph of $y = 0.5x^2 + k$?
III.A.2.

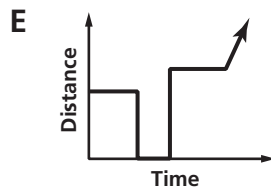
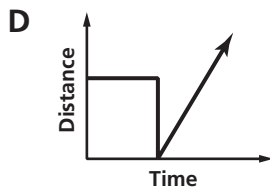
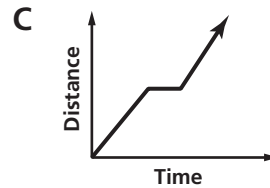
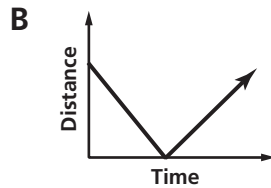
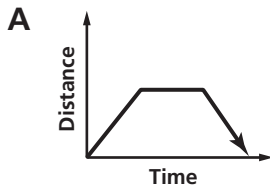


48 **D**



- 49 Which graph best represents a drive from Orangeburg to Lake Murray, with a stop about halfway to stretch, and then continuing on with the trip?

49 **C**



I.B.3.

- 50 Mr. Abravanel uses a formula to choose scores from a musical text that he uses to practice the piano. If he chooses scores 5, 8, 11, 14, 17, and 20, which recursive formula did he use? **I.A.3.**

50 **B**

A $a_n = 3n$

B $a_n = 2 + 3n$

C $a_n = 3$

D $a_n = 2 + 3$

E $a_n = 2 + 3(n + 1)$





Name: _____

Date: _____

Test Practice

Sample Test 2 (continued)

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

51 What is the slope of the graph of $y = \frac{8}{5}x - 3$? **II.B.1.**

- A 8
- B $\frac{8}{5}$
- C 3
- D $-\frac{8}{5}$
- E -3

51 **C**

52 The speed of a particular fighter jet is 600 meters per second. What is its speed in miles per hour if there are about 1609 meters in a mile? **I.C.2.**

- A about 161 mph
- B about 268 mph
- C about 805 mph
- D about 1342 mph
- E about 2682 mph

52 **D**

53 Which table has domain and range values that correspond to $f(x) = -x^2 - 3x + 2$? **III.A.1.**

A

| | | | | |
|---|----|----|---|---|
| x | -5 | -2 | 0 | 2 |
| y | 8 | -4 | 2 | 8 |

B

| | | | | |
|---|----|----|---|----|
| x | -5 | -2 | 0 | 2 |
| y | -8 | 4 | 2 | -8 |

C

| | | | | |
|---|----|----|---|----|
| x | -5 | -2 | 0 | 2 |
| y | -8 | -4 | 2 | -8 |

D

| | | | | |
|---|----|----|---|---|
| x | -5 | -2 | 0 | 2 |
| y | -8 | 4 | 2 | 4 |

E

| | | | | |
|---|----|----|---|----|
| x | -5 | -3 | 0 | 2 |
| y | -8 | -4 | 2 | -4 |

53 **B**

54 If $x = -3$, then $4x^2 - 11$ is **I.D.1.**

- A -47.
- B -25.
- C -23
- D 1
- E 25.

54 **E** 



Name: _____

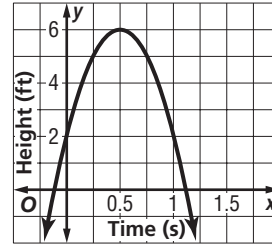
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Test Practice

Sample Test 2 (continued)

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 55 The graph shows the path of a beach ball tossed between two friends. What can you conclude from the graph? **III.A.4.**
- A The ball reached its maximum height in 6 s.
 - B The ball flew 6 ft above its launch height.
 - C The friend caught the ball at 2 ft.
 - D The ball was in the air 0.5 s.
 - E At one second the ball was still in the air.

55 **E**

- 56 If $8h^2 + 4h - 3h(5 + h)$ is simplified, the result will be **I.D.6.**
- A $-7h^2 - h.$
 - B $-7h^2 + 4h.$
 - C $5h^2 - h.$
 - D $5h^2 - 11h.$
 - E $7h^2 - h.$

56 **D**

- 57 Yelina opened a \$100 savings account. The first month she deposits \$25 into the account. Thereafter, she plans to deposit \$25 more each month than she did the previous month. If Yelina sticks to her plan, how much money will she deposit into the account the fifth month? **I.A.6.**
- A \$100
 - B \$125
 - C \$150
 - D \$225
 - E \$250

57 **B**

- 58 Chelsea started a walking program around a park near her home. The first week she walked at an average rate of 3 miles per hour, and the second week at an average rate of 3.5 miles per hour. If Chelsea graphs each week of her walking program, how will the graph of the second week differ from the graph of the first week? **II.B.6.**
- A The y -intercept will change from $(0, 3)$ to $(0, 3.5)$.
 - B The y -intercept will change from $(3, 0)$ to $(3.5, 0)$.
 - C The slope of the graph will change from 3 to 3.5.
 - D The graph will shift downward 0.5 units.
 - E The graph will shift upward 0.5 units.

58 **C** 



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Test Practice

Sample Test 2 (continued)

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

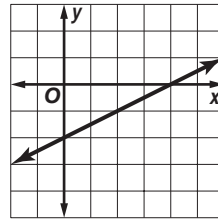
59 Which statement describes $f(x) = 5x + 8$? **I.A.1.**

- A The number 8 is the independent variable.
- B Since f depends on x , x is the independent variable.
- C Since x depends on f , f is the independent variable.
- D Since x depends on the number 5, it is the dependent variable.
- E Since the values for f and x are unknown, both are dependent variables.

59 **B**

60 When the domain of the function shown on the graph is -2 , what is the range? **II.A.2.**

- A -3
- B -1
- C 0
- D 2
- E The set of all real numbers.

60 **A**

Read each question and write your answer in the space provided. Be sure to show all your work.

61 Danielle made a table to determine how long it will take her to drive 400 miles to visit her grandparents. Complete the table and describe the relationship in the table. [3] **I.A.2.**

| | | | | | | | |
|--------------|----|-----|-----|------------|------------|------------|------------|
| Hours | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Miles | 55 | 110 | 165 | 220 | 275 | 330 | 385 |

Sample answer: The table describes a linear relationship. Time values increase by 1 from left to right, and distance values increase by 55 from left to right. For every hour, the distance increases 55 miles.

62 Explain what is different and what is similar in the graphs of $y = 0.5x^2$ and $y = 2x^2$. [2] **III.A.2.**

Sample answer: The graph of $y = 0.5x^2$ is wider than the graph of $y = 2x^2$. The shapes of the graphs are different. The graphs are similar in that both have a vertex at the origin of the graph and both open upward.





Name:

Date:

Test Practice

Sample Test 2 (continued)

Read each question and write your answer in the space provided. Be sure to show all your work.

- 63 The matrix shows the number of reservations at a golf course in Myrtle Beach. The golf course offers a special of \$35 for adults and \$12 for juniors to age 17. Write a matrix that shows the total amount the golf course can expect from reservations. [2] **I.C.6.**

| | | |
|--------|------|------|
| | A.M. | P.M. |
| Adult | 42 | 65 |
| Junior | 18 | 23 |

$$\begin{bmatrix} 1470 & 2275 \\ 216 & 276 \end{bmatrix}$$

- 64 Name the property that justifies each step in the following solution. Write the property next to the step. [4] **II.C.3.**

| | |
|--------------------------------|---------------------------------------------|
| $-5x + 12 < 14 - 2x$ | Given |
| $-5x + 12 + 2x < 14 - 2x + 2x$ | Addition Property of Inequalities |
| $-5x + 12 + 2x < 14$ | Additive Inverse |
| $-5x + 2x + 12 < 14$ | Commutative Property of Addition |
| $-3x + 12 < 14$ | Addition Property of Inequalities |
| $-3x + 12 - 12 < 14 - 12$ | Subtraction Property of Inequalities |
| $-3x < 2$ | Additive Inverse |
| $x > -\frac{2}{3}$ | Division Property of Inequalities |

- 65 Suppose you solve $6x^2 - 3x + 5 = 7 - 4x$. What method could you use to show that your solutions are mathematically reasonable? [2] **I.D.5.**

Sample answer: Substitute each solution into the original equation to check that the solutions result in true statements.

- 66 Write an equation of the line with a slope of $-\frac{4}{3}$ and a y -intercept of 3. [2] **II.B.4.**

$$y = -\frac{4}{3}x + 3$$





Name:

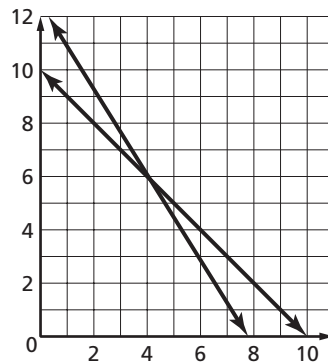
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Test Practice

Sample Test 2 (continued)

Read each question and write your answer in the space provided. Be sure to show all your work.

- 67 A pet supply store mixed specialty dog biscuits that sell for \$6.75 per pound with regular dog biscuits that sell for \$4.25 per pound. The store will sell the 10-pound mixture for \$5.25 per pound. Interpret the graph to determine how many pounds of each type of dog biscuit were used in the 10-pound mixture. Show that your conclusion is reasonable. [4] **II.D.3.**



Sample answer: Since the solution of the graph is (4, 6), the mixture is 4 lb to 6 lb. $4(6.75) + 6(4.25) = 52.50$ for 10 lb or 5.25 per pound. Since this is the price per pound of the 10-lb mixture, the mixture is 4 lb specialty dog biscuits and 6 lb regular dog biscuits.

- 68 Following is a list of the numbers of species of reptiles, including turtles, lizards, and snakes, recorded daily at a natural life research center. Make a stem-and-leaf plot of the data, and then find the mean, median, mode, and range. Include a key and title. [5] **I.B.4.**

4, 13, 5, 9, 15, 8, 9, 6, 12, 21, 13, 9, 6, 19, 13, 9, 11, 17, 25, 20

mean: 12.2
median: 11.5
mode: 9
range: 21

Reptile Species

| Stem | Leaf |
|------|-------------------|
| 0 | 4 5 6 6 8 9 9 9 9 |
| 1 | 1 2 3 3 3 5 7 9 |
| 2 | 0 1 5 |

$1|7 = 17$

- 69 What metric unit of measure would you use to measure the mass of a shopping bag filled with a DVD player and 5 DVD movies? [1] **I.A.5.**

kilograms





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Test Practice

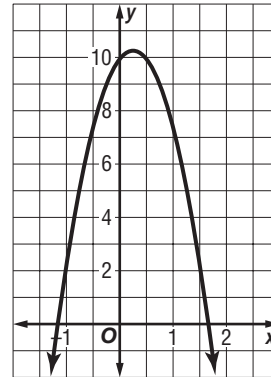
Sample Test 2 (continued)

Read each question and write your answer in the space provided. Be sure to show all your work.

- 70 What are the dimensions of a photograph if the width is w , the length is $2w - 4$, and the area of the photograph is 240 square centimeters? Summarize the steps you used to solve the problem. [3] **I.D.3.**

w is 12 cm and ℓ is 20 cm; sample answer: Since $A = \ell w$, I substituted $w(2w - 4) = 240$ into the formula. I set the expression $2w^2 - 4w - 240$ equal to zero, and then I factored out the 2 to get the factors $(w + 10)(w - 12)$. Since -10 does not make sense, I used 12 as the width and then solved for length.

- 71 The function graphed at the right shows the path of Miguel as he dives from a 10-meter diving platform into a pool below. The solution of the related equation gives the time t in seconds he is in the air before he enters the water. Refer to the roots of the function to eliminate the time at which Miguel enters the water. [3] **III.A.6.**



Sample answer: The negative root does not make sense for this situation since time cannot be negative. The positive root between 1.5 and 2 gives the solution that Miguel enters the water between 1.5 and 2 seconds after he dives from the platform.

- 72 Two problem situations that involve exponential growth or exponential decay are given below. Indicate after each situation whether it involves growth or decay and then write an equation to represent the situation. Do not solve the problems. [5] **III.B.3.**

The population in a small town grows at a rate of 10% per year. The current population is 4600 and you want to predict what it will be in 10 years at the current rate of growth.

exponential growth; $y = 4600(1 + 0.1)^{10}$

Juliana bought a car that depreciates at a rate of 15% per year. She paid \$6600 for the car and she wants to know its value after 2 years at the current rate of depreciation.

exponential decay; $y = 6600(1 - 0.15)^2$





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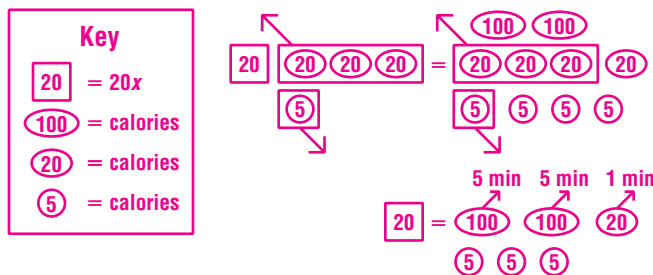
Test Practice

Sample Test 2 (continued)

Read each question and write your answer in the space provided. Be sure to show all your work.

- 73** Hanot burns 300 calories on the elliptical trainer at the gym each time he works out. If he burns 20 calories per minute on average and has already burned 65, how much longer will it take to complete his workout? Draw a diagram of a concrete model that represents the situation. Based on the model, give a reasonable solution of the problem. The model can be of your choosing. Provide a key that allows someone else to understand your model. [5] **II.C.4.**

Student answers will vary. Models should represent $20x + 65 = 300$. Sample answer:



The model shows that after 11 minutes, Hanot has 15 more calories to burn. Since he burns 20 calories a minute, it will take less than a minute to burn them. A reasonable answer is that it would take a little less than 12 minutes to finish the workout.

- 74** The table shows the relationship between the number of security personnel s during a Van Gogh exhibit at the art museum and the number of patrons p in the museum. Describe the relationship in words. [3]

| | | | | |
|-----|----|-----|-----|-----|
| s | 6 | 9 | 12 | 15 |
| p | 96 | 144 | 192 | 240 |

II.A.3.

Sample answer: For every 16 patrons, there is one security person.

- 75** State whether the following statement is *true* or *false*. If it is false, justify your reasoning. [2] **I.C.4.**

The set of whole numbers is closed under subtraction.

False; sample answer: $2 - 3 = -1$, which is not a whole number.

- 76** Horseshoe crabs have changed little from a similar species that lived 250 million years ago. Write this number in standard form and in scientific notation. [3] **I.C.1.**

250,000,000; 2.5×10^8





Name: _____

Date: _____

Test Practice

Sample Test 2 (continued)

Read each question and write your answer in the space provided. Be sure to show all your work.

- 77 Jae-Hwa is not certain whether $3^5 \cdot 3^4 = 3^{20}$ is true. Describe a pattern Jae-Hwa could use to find out. Explain what the pattern tells you about the law of exponents for multiplying powers that have the same base. Is the statement $3^5 \cdot 3^4 = 3^{20}$ true? [3] **III.B.1.**

Sample answer: Jae-Hwa could use the pattern $(3 \cdot 3 \cdot 3 \cdot 3 \cdot 3)(3 \cdot 3 \cdot 3 \cdot 3)$ to show that $3^5 \cdot 3^4 = 3^9$. The pattern shows that when you multiply powers that have the same base, you add the exponents. The statement $3^5 \cdot 3^4 = 3^{20}$ is therefore not true.

- 78 The data in the table represent the hourly cost to rent a rototiller at Jake's Garden Shop. If you graph the data, what is the meaning of the slope and y -intercept of the graph? [4] **II.B.2.**

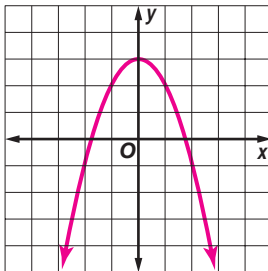
| | | | | | |
|-----|----|----|----|----|----|
| x | 0 | 1 | 2 | 3 | 4 |
| y | 20 | 30 | 40 | 50 | 60 |

Sample answer: The y -intercept at $(0, 20)$ represents the minimum fee to rent a rototiller. The slope is 10 or \$10, which represents the rate of change or the cost per hour to rent the rototiller.

- 79 Write a recursive formula for the series 4, 7, 10, 13, ... [2] **I.A.6.**

Sample answer: $a_n = 3n + 1$

- 80 Use the grid provided below to sketch the graph of $y = -x^2 + 3$. [3]

**I.B.1.**