Name: _____ Date: _____ Block: ____

Algebra 2 Honors- Week 18 Homework

Monday – No School! No Homework!

Tuesday-

Logarithmic Functions Assignment

Find two points and sketch the graph of each function.

1. $f(x) = log_9 x$ 2. $f(x) = log_4 x$ 3. $f(x) = log_{1.5} x$

4. Find the function that is inverse to $f(x) = log_4 x$.

Using the graph of $\boldsymbol{f(x) = log_4 x}$, find these transformations.

5. $f(x) = log_4(x + 3) - 1$ 6. $f(x) = -2log_4 x$ 7. $f(x) = -log_4(-x)$ 8. $f(x) = \frac{1}{4} log_4(x - 2)$

9. Make a chart and graph: $f(x) = log_{1/4} x$. Explain how the graph of this function is similar and different from $f(x) = log_4 x$.

10. Use the last problem to find two points and graph $f(x) = log_{1/3} x$.

11. What will happen if we replace the 4 in $f(x) = log_4 x$ with a -4? Explain your answer.

Wednesday-

Interest Problems Assignment

1. Five thousand dollars is invested at 8% interest compounded annually. Determine how much the investiment is worth after:
   a) 1 year
   b) 2 years
   c) 3 years
   d) 10 years
2. Redo Problem #1 if the interest was compounded quarterly.
3. Redo Problem #1 if the interest was compounded monthly.
4. Two hundred dollars is invested at 9.6% interest compounded annually. Determine how much the investment is worth after:
   a) 1 year
   b) 5 years
   c) 10 years
   d) 20 years
   e) Use your answers to parts a) - d) to estimate the doubling time for the investment.
5. The Bank of Narnia offers 6% interest compounded monthly. The Bank of Rivendell offers 6.1% interest compounded quarterly. Which bank pays more interest per year? Explain your answer.

Thursday-

Natural Logarithm Assignment

1. I want to choose between two savings plans for $6000. One offers 7% compounded quarterly and the other offers 6.75% compounded continuously. Which investment will earn more interest in 5 years and by how much?
2. How long will it take $1000 to double if put into an account that earns 2.5% compounded continuously?
3. What interest rate would I have to have to see $1000 double in 10 years?

4. A certain town which currently has 150,000 residents is losing 7% of its population per year due to the closing a large sugar beet manufacturing plant. How many people will there be in 5 years?
5. Given the town in the last problem. How long will it be until there are only 100,000 residents?
6. Radioactive lead 210 decays at a continuous rate of 3.2%. Write a function if we begin with 500mg of lead 210.
7. Given the function in problem #6, find the remaining amount after:
   a) 4 years   b)8 years   c)20 years   d) find the half life
8. Pre-historic cave paintings were discovered in a cave in France. The paint contained 12% of the original carbon-14. Estimate the age of the paintings given that the continuous rate of change was -0.000121. (Hint: what was the initial percent of carbon-14 in the paint?)

Friday- End of Unit Test Review! No homework besides studying!

Practice Test for Exponential and Logarithmic Functions Unit

Learning Objectives:
A. Simplify rational exponents.
B. Rewrite a root as a rational exponent.
C. Use rational exponents to rewrite an expression in simplest radical form.
D. Simplify real number exponents
E. Solve an equation with rational exponents.
F. Write a function to model an exponential situation.
G. Use an exponential model to answer questions about a real life situation.
H. Identify the major features of an exponential graph: y-intercept, asymptote, domain and range.
I. Graph an exponential growth or decay function.
J. Use transformations to sketch the graph of an exponential function.
K. Identify how the base of an exponential function affects the shape of the graph.
L. Transform a logarithm to an exponent and an exponent to a logarithm.
M. Simplify a logarithm.
N. Solve an exponential equation by converting it into a logarithm.
O. Solve a logarithmic equation by converting it into an exponent.
P. Identify the major features of an logarithmic graph: x-intercept, asymptote, domain and range.
Q. Graph a logarithmic function.
R. Use the compound interest formula to answer questions about interest.
S. Use the continuous growth or decay function to model a real life situation.

Question #	Learning Objective	Know It	Feel Unsure		Right	Wrong	Simple Mistake	Need to Study
1	A							
2	B							
3	C							
4	D							
5	E							
6	E							
7	F							
8	G							
9	H, I							
10	H, I							
11	J							
12	K							
13	L							
14	M							
15	N							
16	O							
17	P, Q							
18	R							
19	S							

1. Simplify: $32^{-\frac{4}{5}}$ 2. Rewrite as an exponent: $\sqrt[4]{2x^6y^8}$ 3. Rewrite in simplest radical form: $\sqrt[4]{27} \cdot \sqrt[3]{81}$

4. Simplify: $3^{3\pi-1} \cdot 3^{\pi+4}$ 5. Solve: $x^{\frac{2}{5}} + 5 = 14$ 6. Solve: $36^x = \frac{1}{\sqrt{6}}$

7. A mouse population is 10,000. It is decreasing at a rate of 20% per year. How many will be left in 2 years?

8. In problem #7, when will the population be half the original size?

9. Graph this function using two majors points: $f(x) = 5^x$ Identify the domain, range, y-intercept and asymptote.

10. Graph this function using two majors points: $f(x) = \left(\frac{1}{3}\right)^x$ Identify the domain, range, y-intercept and asymptote.

11. Given the function: $f(x) = \left(\frac{1}{3}\right)^x$, find $f(x) = -\left(\frac{1}{3}\right)^{x-4} + 7$.

12. Explain how making b in $f(x) = b^x$ larger or smaller changes the shape of the graph. What values cannot be b?

13. a) Convert to a logarithm: $5^{\frac{1}{2}} = \sqrt{50}$, b) Convert to an exponent: $log_{11}1 = 0$ 14. Simplify $Log_9 27$

15. Solve: $5^{x-1} = 100$ 16. Solve: $log_x 20 = 3$

17. Graph this function using two majors points: $f(x) = log_7 x$ Identify the domain, range, y-intercept and asymptote.

18. I invest $7500into an account that gets 5% interest compounded monthly. When will I double my money?

19. An adult takes 400 mg of ibuprofen. Each hour, the amount of ibuprofen in the person's system decreases by about 29%. How much ibuprofen is left after 6 hours?