Practice Test for Polynomial Functions Unit

Learning Objectives:
- A. Divide polynomials using long division.
- B. Divide polynomials using synthetic division.
- C. Use synthetic division to determine evaluate a function.
- D. Determine whether a binomial is a factor a polynomial.
- E. Use the roots of a polynomial to write a polynomial function.
- F. Solve a polynomial equation with rational roots.
- G. Solve a polynomial equation with rational and irrational roots.
- H. Graph a polynomial using the zeros and end behavior.
- I. Identify the end behavior of a polynomial function.
- J. Graph a polynomial using transformations.
- K. Identify the local minimum and maximums of a polynomial function.
- L. Identify the interval of increase and decrease of a polynomial function.
- M. Model volume with a polynomial function.

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	F							
7	G							
8	H							
9	I, L							
10	J, L							
11	K, L							
12	I, J							
13	M							
14	N							

1. Divide $x^2 + 3x - 1$ into $x^3 + 5x^2 + 4x - 1$ using polynomial long division.

2. Use synthetic division to divide $2x - 1$ into $x^3 - 3x^2 + 7x - 4$.

3. Given $f(x) = x^4 - 2x^3 + 7x - 4$, find f(3).

4. Determine whether $x + 3$ is a root of $f(x) = 2x^3 + 4x^2 - 5x + 9$.

5. Write a polynomial equation given the roots: 2, 3, 5i.

6. Find all the rational roots for: $x^3 - x^2 - 14x + 24 = 0$.

7. Find all the rational and irrational roots for: $2x^4 - 5x^3 + 8x^2 - 15x + 6 = 0$.

8. Given $f(x) = x^3 + 3x^2 - 9x + 5 = 0$, find the zeros and sketch a graph.

9. Describe the end behavior of the given polynomial: $-5x^4 - x^2 + 25 = 0$.

10. Use transformations to graph: $f(x) = 2(x - 3)^3 + 4$.

11. Identify the local minimums and/or maximums as well as the intervals of increasing and decreasing.

12. Write a polynomial equation for the graph to the right (notice the x and y-intercepts).

13. A box with a square base has a height that is two inches more than the length or width.
- a) Write a polynomial function that models the volume of this box.
- b) What is the volume of the box if the base has side length 5in?
- c) What is the length of the base if the polynomial has 45 in^3?