Polynomials Review

Name_____

Warm Up: Make sure you TRY every problem

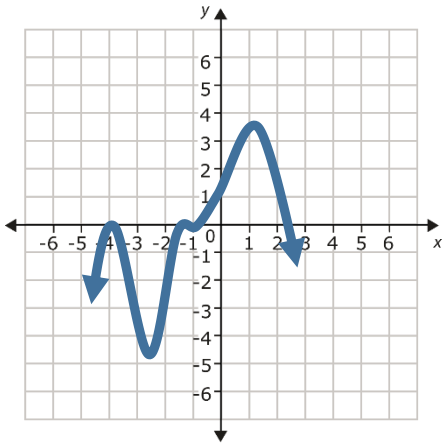
1. Factor: $12r^3 - 9r^2 + 4r - 3$

2. If the factors of a polynomial are $(3k^2 + 1)(4k - 3)$, what are the roots?

3. A) Name the solutions to the graph at the right:

   B) Name the degree for the graph at the right:

   C) Name the multiplicity of each zero:



4. Name the translation for the following function:

   $f(x) = -2(x - 3)^3 - 4$

5. Name the y intercept of the following function:

   $f(x) = 12x^4 - x^3 + 2x + 5$

Guide Notes:

Evaluate, simplify, and factor polynomial expressions

Evaluate: _____ in a _____ and _____ the expression

$f(3) = 2r^3 + 5r^2 - r - 3$

Simplify: Do whatever _____ you can. Do not _____ ____ your own rules. However you simplify you must follow the rules in math.

$f(x) = (x - 3)(x + 2)^2$

Factor: This is the opposite of simplifying. You are finding what multiplies to get the original problem. Often this will be done by grouping for a polynomial.

(#1 from warm up)

Find minimum/maximum values, domain/range of functions.

Minimum: _____ point on a curve **Maximum:** _____ point on a curve

These can be relative or absolute.

Relative – talking about a _____ _____ of the graph

Absolute – talking about over the _____ graph

Domain – ____ values of a graph (_____)

Range – ____ values of a graph (_____)

Zeroes, X – intercepts, Solutions, Roots – They all mean the same thing!!!

#2 from warm up

Multiplicity occurs when you have _____ solutions (2 cause a _____, 3 _____ and goes through the x axis)

Degree: add up all of the _____ including their multiplicity

#3 from warm up

Translations for Quadratics and Cubics

$f(x) = a(x - h)^2 + k$ **$f(x) = a(x - h)^3 + k$**

Vertex: _____ inflection point: _____

Horizontal translation: _____ Vertical translation: _____

If a is negative it _____ over the x axis

If a is between 0 and 1 or 0 and -1 it is a _____ (makes it _____)

If a is greater than 1 or less than -1 it's a _____ (makes it _____)

#4 on warm up

Y-intercept, Degree, and Number of Turns

Y-intercept: where it crosses the _____ on a graph or what the value is when x = _____ in an equation.

#5 on warm up

Degree: When looking at the equation it's the _____ exponent

Number of turns = _____

Calculator Tricks - Put the function into the y = part on your calculator

To find the Maximum/Minimum:
2nd Trace (calc)
Choose Maximum or Minimum
Move spider man to the left side of your max/min press ENTER
Move spider man to the right side of your max/min press ENTER ENTER

To find the x-intercepts:
2nd Trace (calc)
Choose zero
Move spider man to the left side of your x-int press ENTER
Move spider man to the right side of your x-int press ENTER ENTER

Practice Problems:

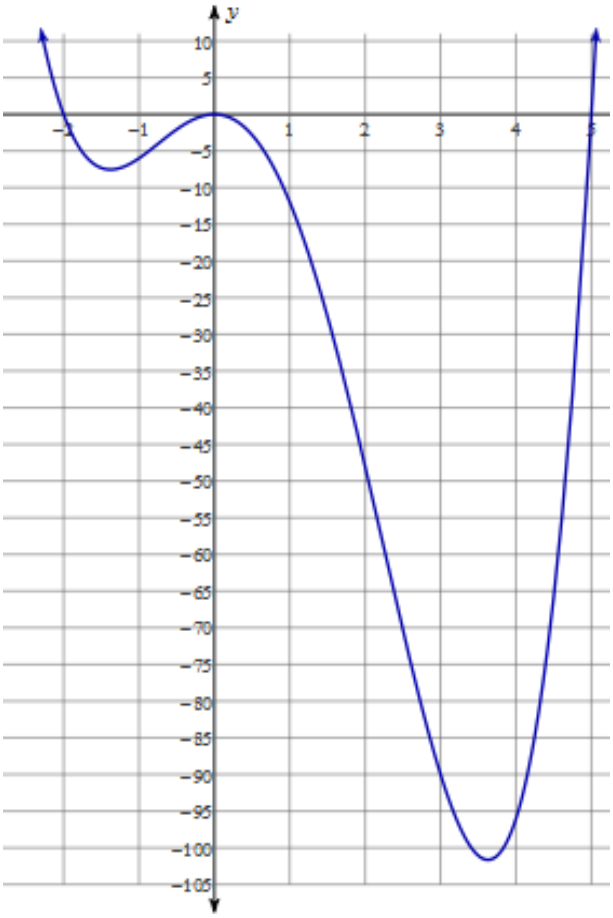
Simplify:

1. $(x^3 + 2x - 4) + (x^2 - 4x + 1)$
2. $(x^3 + 2x - 4) - (x^2 - 4x + 1)$
3. $(2x - 4)(x^2 - 4x + 1)$
4. $(x + 2)^2$

5. Evaluate problems 1-4 at x = 6

6. Factor: $x^2 - 4x - 12$
7. Factor: $54x^2 + 108x + 48$
8. Factor: $12x^3 - 9x^2 - 16x + 12$

9. Given the graph at the right:



a. Name the degree

b. Name all relative maximums

c. Name all relative minimums

d. Name the absolute maximum

e. Name the absolute minimum

f. Name the roots and their multiplicities

10. Given the equation: $f(x) = -2(x-3)^3 + 2$

Describe the translation from the parent graph, make sure to include vertex/inflection point, reflections and stretch/skew.

11. What is the y-intercept of the equation above?

12. Use your calculator to find the max/min and zeroes of the following equation: $f(x) = -2x^2 + 3x + 2$

Answers: 1. $x^3 + x^2 - 2x - 3$ 2. $x^3 - x^2 + 6x - 5$ 3. $2x^3 - 12x^2 + 18x - 4$ 4. $x^2 + 4x + 4$ 5. (1)237 (2)211 (3)104 (4)64 6. (x-6)(x +2) 7. 6(3x+2)(3x+4) 8. $(3x^2 - 4)(4x - 3)$ 9. A)4 B)(0,0) C)(-1.5, -7.5) & (3.5, -102) D)none E) (3.5, -102) F) x = -2 mult of 1, x = 0 mult of 2, x = 5 mult of 1 10. Reflects over the x axis, inflection pt at (3,2), translated right 3, up 2 & is skewed 11. (0, 56) 12. Vertex (.75, 3.125) zeroes at x = -.5 and x = 2