Algebra 2 2013-2014 Name:

Semester 2 Review Period:

Polynomials

- Polynomial Division
- End Behavior of a Polynomial
- Write an equation from a description and/or a graph

Divide.

$(x^4 + x^3 - 27x - 27) \div (x + 9)$	$(-x^3 + 4x^2 + 9) \div (x - 3)$	$(3x^3 - 2x^2 + 2x - 5) \div (x + 1)$

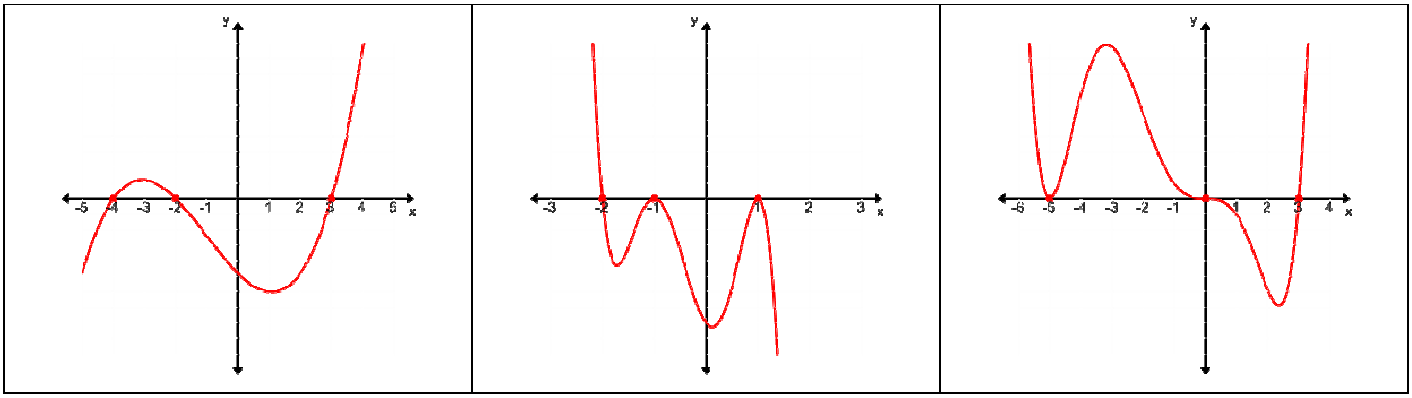
Describe the end behavior of the polynomial. (↑↑, ↓↓, ↑↓, or ↓↑)

$f(x) = 4x^2 - 5x + 2$	$f(x) = -x^5 + 3x^3 - 2x + 4$	$f(x) = 8x^4 - 4x^6 + 3x$

Write a polynomial function of least degree (in factored form) with the following zeros.

-1 (mult 3), 0, 2,	-2 (mult 2), 2 (mult 2)	0 (mult 2), 3	-2 (mult 3), 1 (mult 2), 4

Write a polynomial function for the graphs below.



Quadratics

- Factor completely
- Graph – vertex form
- Write an equation from a graph
- Convert a function from standard form to vertex form
- Solve – use an appropriate method
  - graphing (with calculator)
  - factoring
  - completing the square
  - quadratic formula

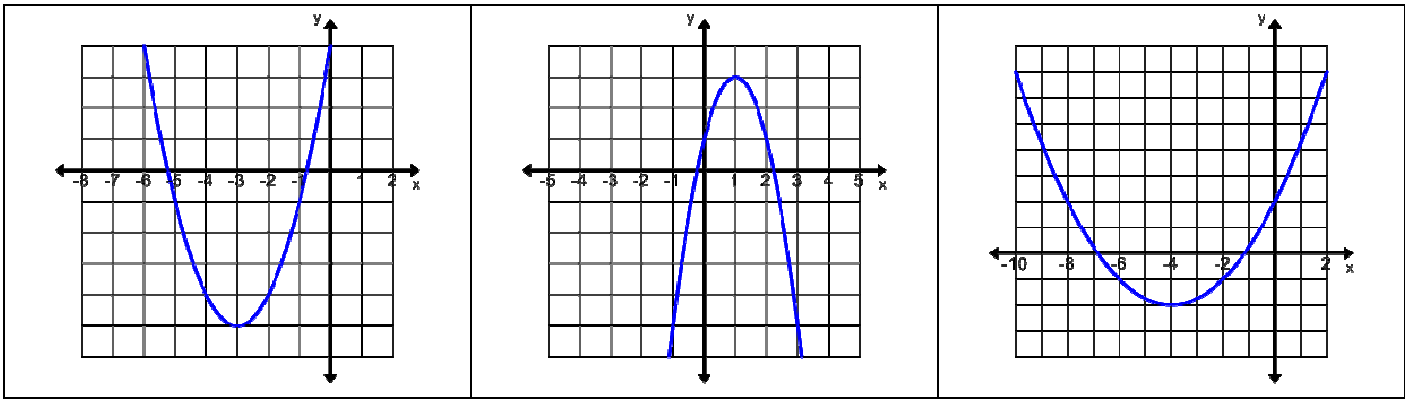
Factor completely.

$3x^3 - 6x^2 - 45x$	$16x^2 - 1$	$4x^2 - 13x + 3$
$3x^3 - 27x$	$x^2 + 18x + 81$	$2x^2 + 9x + 10$

Graph.

$f(x) = (x-3)^2 + 2$	$f(x) = -(x+1)^2 - 4$	$f(x) = 2(x-5)^2$

Write an equation for the functions graphed below.



Rewrite the following equations in vertex form.

$y = x^2 - 2x - 3$	$y = -2x^2 + 2x + 1$	$y = x^2 + 5x + 4$

Solve for x.

$3x^2 + 10x + 3 = 0$	$-4x^2 - 4x + 3 = 0$	$0.5x - 0.01x^2 = 0$

Radical Functions

- Simplifying Radical Expressions
- Operations with Radicals
- Graphing Radical Functions
- Solving Radical Equations

Simplify.

$\sqrt[4]{x^7y^4}$	$\left(\frac{12x^2y^7}{3x^4y^5}\right)^{\frac{3}{2}}$	$\sqrt[3]{8x^3y^9}$	$\sqrt[3]{\frac{y^{15}}{z^6}}$

Simplify.

$3\sqrt{32} + 2\sqrt{50}$	$2\sqrt{98} - 5\sqrt{8}$	$-6\sqrt{27} + \sqrt{48}$

Graph.

$y = \sqrt{x+2} - 4$	$y = \sqrt[3]{x-4} + 1$	$y = -\sqrt{x} - 3$	$y = \sqrt[3]{x-3}$

Solve for x.

$\sqrt{2x-8} = \sqrt{19-x}$	$(-20-2n)^{2/5} - 7 = -3$	$6 = 3(x-17)^{1/4}$

Inverse Functions & Operations with Functions

- Find the inverse of a function
- Find composite functions – $f(g(x))\ and\ g(f(x))$
- Add, Subtract, Multiply, and/or Divide functions

Find the inverse of the following functions.

$f(x) = \sqrt{\dfrac{x+1}{3}}$	$f(x) = 2x^3 + 4$	$f(x) = \sqrt[5]{x} + 6$

Let $f(x) = x - 3$ and $g(x) = x^2 - 2x$. Find the following.

$(fg)(x)$	$(g - f)(x)$	$f\big(g(x)\big)$

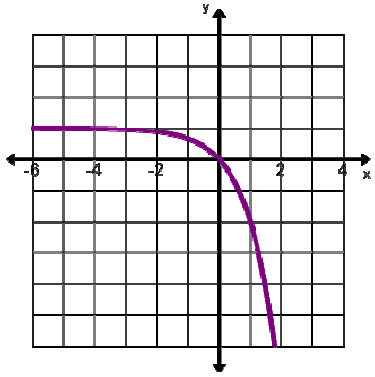
Let $f(x) = \sqrt{(x-1)^3 + 2}$ and $g(x) = x + 1$. Find the following

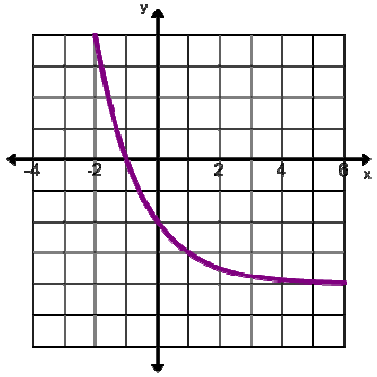
$f\big(g(x)\big)$	$g(f(x))$

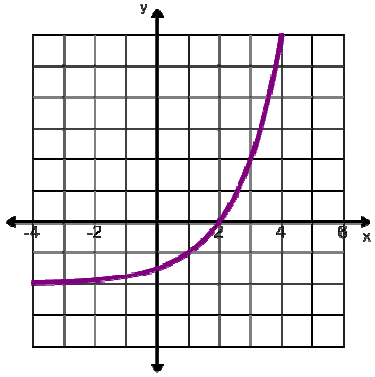
Exponential Functions

- State the domain and range of an exponential equation
- Graph exponential functions
- Solve exponential equations
- Use an exponential model to make a prediction.

State the domain and range of the following exponential functions.







Graph.

$y = -4(0.75)^{x+2} - 1$	$y = \dfrac{1}{2}(3)^{x-4} + 5$	$y = 3\left(\dfrac{4}{7}\right)^{x} - 2$

Solve for x.

$36^{3-2x} = 216^{2x}$	$\left(\dfrac{1}{10}\right)^{-2x} = 100$	$2(18)^{x+4} = 31$	$6^{x+1} - 10 = -3.7$

You have inherited land that was purchased for $30000 in 1960. The value of the land increased by approximately 5% per year. What is the approximate value of the land now (in year 2014)?

An adult takes 400 mg of ibuprofen. Each hour, the amount of ibuprofen in the person's system decreases by about 29%. How long does it take for the amount of ibuprofen in the system to reach 100 mg?

Logarithmic Functions

- Expand and contract logarithmic expressions using the Properties of Logarithms
- Solve logarithmic equations

Expand.

$\log_3 \frac{a\sqrt[3]{b}}{c^4}$	$\log \frac{x^2y^4}{z}$	$\log_8 \left(\frac{x^3y}{z^4}\right)^2$

Write as a single logarithm.

$4\log x + \frac{1}{3}\log y - 2\log z$	$3\log_4 x + \frac{1}{2}\log_3 z - (\log_3 x - \log_3 4)$

Solve for x. Be sure to check for extraneous solutions.

$\log_{15}(4x+8) = \log_{15}(3x-2)$	$\log_6 x + \log_6(x+1) = 1$	$\log x - \log(x+5) = 1$

Rational Functions

- Graph rational functions
- Solve rational equations
- Add, subtract, multiply, and/or divide rational functions

Graph.

$y = \frac{2}{x+1} - 4$	$f(x) = \frac{x-2}{x-3}$	$y = \frac{4x+7}{x+2}$

Solve.

$\frac{2}{x-5} = \frac{3}{x+7}$	$4 = 6 + \frac{2}{x+9}$	$\frac{4}{x^2+3x} - \frac{2}{x} = \frac{7}{x+3}$

Perform the indicated operation.

$\frac{2x+4}{x^2+3x+2} \cdot \frac{x+1}{4x-12}$	$\frac{(2x+3)(3x-1)}{x-5} \div \frac{3x^2+2x-1}{x^2-4x-5}$	$\frac{3x}{6x^2-9x} - \frac{4}{x+1}$	$\frac{2}{x^2-16} + \frac{x}{x-4}$