Name: Key Date: _____ Period: _____

Chapter 5 - Sneak Peek

I CAN....

- Multiply polynomials
- Determine the domain & range of a function
- Solve an exponential function using logarithms
- Rewrite a logarithm in exponential form.
- Factor polynomials
- Find the inverse of a function
- Rewrite an exponential equation as a logarithm

1. Multiply each of the following. Be sure to show all your work.

1a. $(x+1)(x-5)$

x^2-4x-5

1b. $(6x+3)(x^2+5x-9)$

	x^2	$5x$	-9
$6x$	$6x^3$	$30x^2$	$-54x$
3	$3x^2$	$15x$	-27

$6x^3+33x^2-39x-27$

1c. $(x-3)^2(2x-7)$

$(x-3)(x-3)(2x-7)$

$(x^2-6x+9)(2x-7)$

	x^2	$-6x$	9
$2x$	$2x^3$	$-12x^2$	$18x$
-7	$-7x^2$	$42x$	-63

$2x^3-19x^2+60x-63$

2. Factor the expressions.

2a. $4y^2-49$

$(2y-7)(2y+7)$

2b. $y^2-13y+42$

42
-6 -7
-13

$(y-6)(y-7)$

2c. $6y^2-7y-10$

	y	-2
$6y$	$6y^2$	$-12y$
5	$5y$	-10

-60
-12 5
-7

$(6y+5)(y-2)$

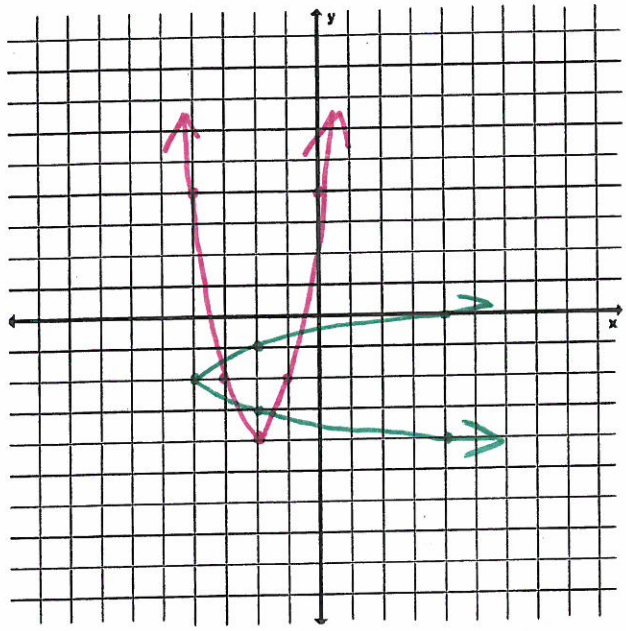
3. Graph $f(x) = 2(x + 2)^2 - 4$ AND its inverse on the graph below.

f(x)

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

$f^{-1}(x)$

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



Is the inverse a function?

NO

Why or why not?

blc it doesn't pass the Vertical Line Test

State the domain and range of each graph.

$f(x) = 2(x+2)^2 - 4$	*Inverse Graph*
Domain: $(-\infty, \infty)$	Domain: $[-4, \infty)$
Range: $[-4, \infty)$	Range: $(-\infty, \infty)$

4. Find the inverse of each of the following functions

4a.

$$g(x) = -7x - 1$$

$$x = -7y - 1$$

$$+1 \qquad +1$$

$$\frac{x+1}{-7} = \frac{-7y}{-7}$$

$$\frac{x+1}{-7} = g^{-1}(x)$$

or

$$g^{-1}(x) = -\frac{x-1}{7}$$

4b.

$$g(x) = 9(x + 7)^2$$

$$\frac{x}{9} = \frac{9(y+7)^2}{9}$$

$$\frac{x}{9} = (y+7)^2$$

$$\sqrt{\frac{x}{9}} = y + 7$$

$$-7 \qquad -7$$

$$\sqrt{\frac{x}{9}} - 7 = g^{-1}(x)$$

4c.

$$f(x) = \frac{\sqrt[3]{7+x}}{9} - 7$$

$$x = \frac{\sqrt[3]{7+y}}{9} - 7$$

$$x + 7 = \frac{\sqrt[3]{7+y}}{9}$$

$$9(x+7) = \sqrt[3]{7+y}$$

$$[9(x+7)]^3 = 7 + y$$

$$-7 \qquad -7$$

$$f^{-1}(x) = [9(x+7)]^3 - 7$$

4d.

$$f(x) = \frac{\sqrt{x+5}}{2} - 3$$

$$x = \frac{\sqrt{y+5}}{2} - 3$$

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

$$2(x+3) = \sqrt{y+5}$$

$$(2(x+3))^2 = y + 5$$

$$-5 \qquad -5$$

$$f^{-1}(x) = [2(x+3)]^2 - 5$$

5. Without using your calculator, simplify each expression. make sure your answer contains only positive exponents. You must show step by step work in order to earn full credit.

5a.

$$(2x^3y^{-5})^{-2}$$

$$2^{-2}x^{-6}y^{10}$$

$$\frac{y^{10}}{2^2x^6} = \frac{y^{10}}{4x^6}$$

5b.

$$\frac{xy^7}{x^5} \bullet \frac{x^3y^9}{x^2y^{11}}$$

$$\frac{x^4y^{16}}{x^7y^{11}}$$

$$\frac{y^5}{x^3}$$

5c.

$$(4x^{-4}y^3)^{-3} \bullet (5x^6y)^2$$

$$4^{-3}x^{12}y^{-9} \cdot 5^2x^{12}y^2$$

$$\frac{5^2x^{12}x^{12}y^2}{4^3y^9}$$

$$\frac{25x^{24}}{64y^7}$$

5d.

$$(4x^{-2}y^{-1})^4$$

$$4^4x^{-8}y^{-4}$$

$$\frac{256}{x^8y^4}$$

5e.

$$\frac{x^5y^2}{x^{-2}} \bullet \frac{x^7y^{-1}}{x^9y^3}$$

$$\frac{x^{12}y^1}{x^7y^3} = \frac{x^5}{y^2}$$

5f.

$$(x^{-6}y^5)^{-1} \bullet (7x^2y^6)^0$$

$$x^6y^{-5} \cdot 1$$

$$\frac{x^6}{y^5}$$

6a. Determine the missing value for the question mark.

$$log_5 125 = \ ?$$

$5^? = 125$

? = 3

6b.

$$log_7 2401 = \ ?$$

$7^? = 2401$

? = 4

6c. $$log_? 121 = 2$$

$?^2 = 121$

? = 11

6d.

$$log_? 64 = 3$$

$?^3 = 64$

? = 4

6e. Rewrite each of the following exponential equations as logarithms.

$$2^4 = 16$$

Log Form:

$\log_2 16 = 4$

6f.

$$6^7 = 279936$$

Log Form:

$\log_6 279936 = 7$

6g. Rewrite each of the following logarithmic equations as an exponential equation.

$$log_5 x = \frac{1}{6}$$

Exponential Form:

$5^{\frac{1}{6}} = x$

6h.

$$log_2 x = \frac{1}{4}$$

Exponential Form:

$2^{\frac{1}{4}} = x$

6i. Solve the following equations. (using logarithms may be useful)

$$8^x = 43$$

$\log_8 43 = x$

$x \approx 1.8088$

6j.

$$27^x = 101$$

$\log_{27} 101 = x$

$x \approx 1.4003$