Precalculus Name: _____

Prerequisite Skills 2023 Period: _____ Date: _____

Use Khan Academy Get Ready for Precalculus Units 2 and 3 and other Khan Academy Videos to support as needed.

Topic 1: Solving

Directions: Solve the following linear equations/inequalities.

1. $12 + 7x = 2x - 5$
2. $5(2x - 3) + 3(x + 1) = 5x + 2$
3. $\frac{5x-2}{8} = 2 + \frac{x}{4}$
4. $-3 < \frac{2x+5}{3} < 5$
5. $3(x - 1) + 2 < 5x + 6$
6. $\frac{x}{3} + \frac{1}{2} \geq \frac{x}{4} + \frac{1}{3}$

Directions: Solve each of the following quadratic equations by the indicated method.

7. Quadratic Formula

   a. $3x^2 - 3x = 3x + 5$
   b. $2x^2 - 10x = -17 - 2x^2$
   c. $x^2 + 8x - 2 = 0$

8. Square Root Method

   a. $(2x - 1)^2 - 15 = -6$
   b. $-3(x + 1)^2 - 1 = 80$
   c. $x^2 + 12 = 50$

9. Factoring

   a. $2x^2 - 3x = 2$
   b. $x^2 - 14x + 40 = 0$
   c. $25x^2 - 20x = -4$

10. Completing the square

    a. $x^2 + 6x = 7$
    b. $4 - 2x = x^2$
    c. $2x^2 - 20x + 3 = 1$

Directions: Solve each of the following exponential equations by the indicated method.

11. Rewriting with Common Bases

a. $5^x = 125$

b. $3^{2x} \cdot 9^{x-1} = 81$

12. Rewriting as a Logarithm

a. $56 = 4 \cdot 3^x$

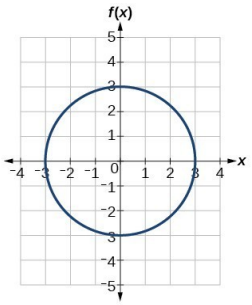
b. $5^{3x-2} + 3 = 93$

c. $3e^{4x} - 10 = 1$

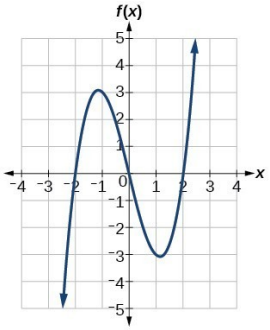
Topic 2: Functions

1. Determine whether each of the following are functions.

X	Y
1	2
2	4
1	5
3	8
4	4
5	10



{(9, 7), (–5, 7), (0, 18)}



2. Use the functions below to answer parts a–h.

$f(x) = 6 - x^2$

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

$h(x) = 2x + 3$

$k(x)$

x	y
-2	3
-1	2.5
0	2
1	1.5
2	1

a. $g(-4) + k(0)$

b. $f(x) = -30$

c. $h(k(2))$

d. $f(h(x))$

e. $f(x) \cdot h(x)$

f. $3g(15)$

g. $k(x) = 2$

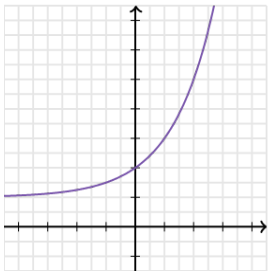
h. $h(x) - f(x)$

3. Determine the domain of each of the following functions.

x	f(x)
-4	9
-2	4
0	-5
3	5
6	-4
7	7
8	-10

$h(x) = \frac{7}{(x-1)(x+5)}$

$g(x) = \sqrt{2x - 9}$



4. Match the function with its equation.

_____	$y = x - 4$	A. Cube Root
_____	$y = 2\|x + 5\|$	B. Rational
_____	$y = x^2 + 2x - 7$	C. Quadratic
_____	$y = (x - 8)^3 + 1$	D. Linear
_____	$y = \sqrt{x} + 2$	E. Cubic
_____	$y = \sqrt[3]{x - 1}$	F. Square Root
_____	$y = \frac{1}{x}$	G. Absolute Value

5. How do you determine the *x*-intercept(s) of a function?

6. How do you determine the *y*-intercepts of a function?

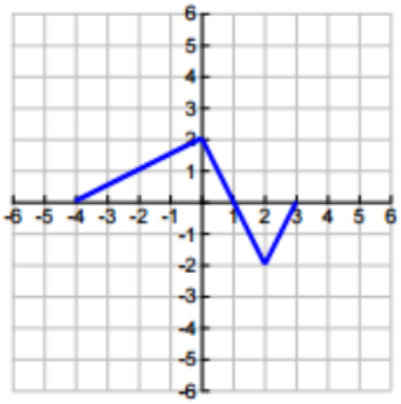
7. Determine the *x*- and *y*- intercepts of the following functions.

a. $y = \frac{2}{3}x - 8$

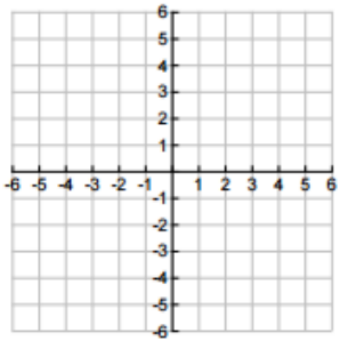
b. $f(x) = 3(x - 1)(11x + 2)$

c. $g(x) = 2x^4 - 20x^2 + 18$

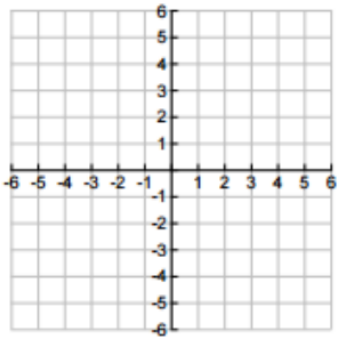
8. Perform the indicated transformations.



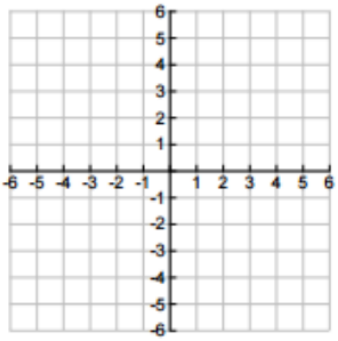
1. $y = 2f(x)$



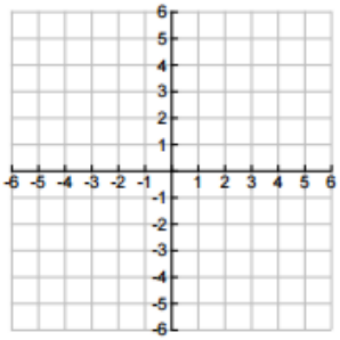
2. $y = -f(x)$



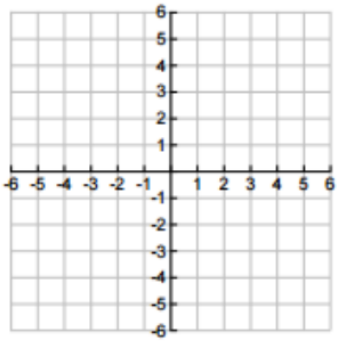
3. $y = f(x-1)$



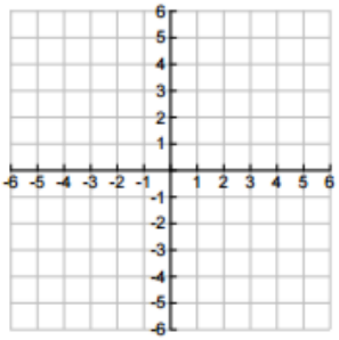
4. $y = f(x)+2$



5. $y = f(-x)$



6. $y = -2f(x+2)+1$



Topic 3: Expressions

1. Perform the indicated operation.

   a. $(x - 7)^2$ b. $(x^3 + 2)(x^4 - 5)$ c. $-2(x + 1)(x - 3)(x + 4)$

2. Simplify the following radical expressions.

   a. $\sqrt{80}$ b. $\sqrt[4]{32}$ c. $\sqrt[3]{54x^3}$

   d. $\sqrt{\frac{4}{25}}$ e. $4\sqrt{3} \cdot \sqrt{21}$ f. $\frac{\sqrt{108}}{\sqrt{27}}$

Topic 4: Miscellaneous

1. Give an equation of a horizontal line.

2. Give an equation of a vertical line.

3. How do you find the inverse of a function from a graph? From an equation?

1. Linear Functions: check out the Algebra 2 summer packet and/or Khan Academy for review.