Unit 1 Test Review

Function Notation

1. Consider the function $f(x) = 5x - 3$ and answer the following questions.
    a. What is the name of the function?

    b. What letter represents the input? What letter represents the output?

    c. What rule does this function represent?

    d. Find $f(-2)$.

2. Consider the function $p(x) = 9x + 55$.
    a. What is the name of the function?

    b. What letter represents the input? What letter represents the output?

    c. What rule does this function represent?

    d. Find $p(7)$.

3. Express the given rule in function notation or give a verbal description.
    a. Multiply by 3, then add 7.

    b. Cube, then subtract.

    c. $f(x) = m + 9$

d. $g(x) = \frac{x-3}{3}$

4. Given $n = 7x - 8$, rewrite this in function notation.

5. Given $l = 2x^2 + 2$, rewrite this is function notation.

6. Given $f(x) = 9x + 9$, rewrite using a two-variable equation.

7. Given $r(x) = 3x^2 + 4x$, rewrite using a two-variable equation.

Net Change - $f(b) - f(a)$

1. Find the net change of $f(x) = 3x + 2$ from $(x = 1)$ to $(x = 4)$.

2. Find the net change of $p(x) = x^2 + 3$ from $(x = 2)$ to $(x = 3)$.

3. If an astronaut weighs 215 pounds on the surface of the earth, then her weight when she is x miles above the earth's surface is given by the function.

$$w(x) = 215\left(\frac{3960}{3960+x}\right)^2$$

   a. Evaluate $w(600)$. What does this answer mean?

   b. Find the net change in the weight of the astronaut from an elevation of 600 miles to an elevation of 6,000 miles.

<u>Composition of Functions</u>

1. Suppose $f(x) = 10x + 4$ and $g(x) = 6x + 4$.
   a. Find $f(g(x))$.

   b. Find $g(f(x))$.

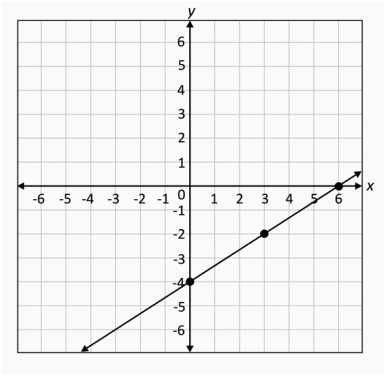
2. Suppose $f(x) = 4x + 1$ and $g(x) = 3x + x$.
   a. Find $f(g(x))$.

b. Find $g(f(x))$.

3. Suppose $f(x) = 7x + 2$ and $g(x) - 2x + 3$. Find $g(f(4))$.

4. Look at the table, graph, and equation and evaluate the following.

x	f(x)
-9	2
-3	8
-1	6
4	-3
7	4



$h(x) = 2x + 2$

a. $f(-1)$ = _____

b. $g(-2)$ = _____

c. $h(8)$ = _____

d. $f(g(1))$ = _____

e. $h(f(4))$ = _____

f. $f(g(h(1)))$ = _____

Inverse Functions

1. Find $f^{-1}(x)$ if $f(x) = 5x - 1$.

2. Find $f(x)^{-1}$ if $f(x) = \frac{x-5}{3}$.

3. Fill in the inverse of the following tables.

x	f(x)
1	4
2	8
3	16
4	32

x	$f(x)^{-1}$

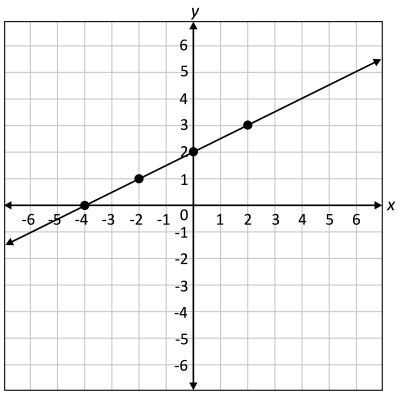
Graphing a Function from a Verbal Description

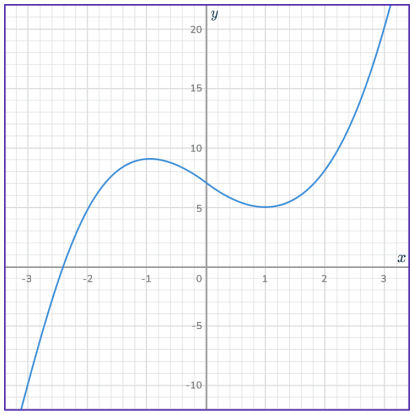
1. When you turn on a bunsen burner in the lab, the temperature depends on how long the burner has been on. Create a graph to represent the situation.

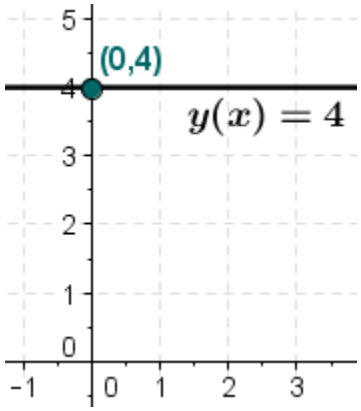
2. A diver is standing at the top of a diving board, ready to jump in. Create a graph to represent the situation.

Graphs of Basic Functions

1. Name each of the following graphs.







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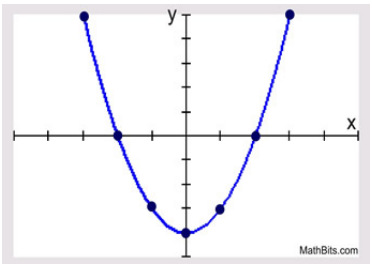
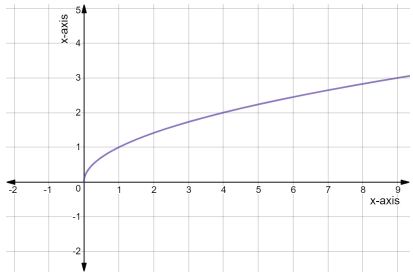




_____ _____

Domain & Range/Local Max. & Min./Increasing & Decreasing

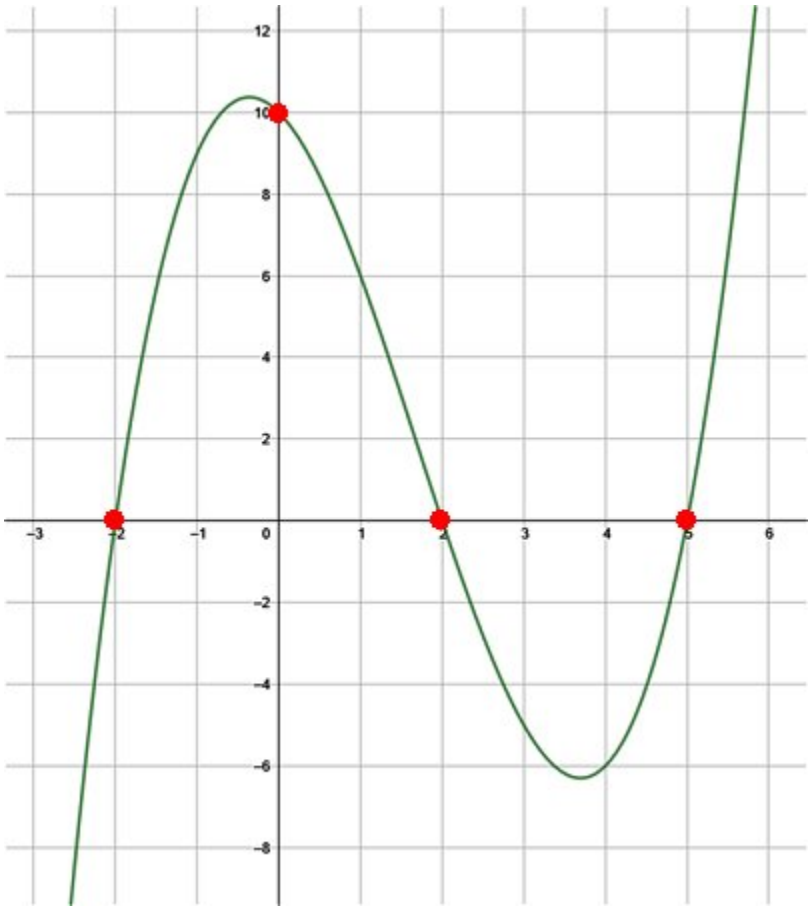
1. When you are writing your domain/range, when would you write parentheses?

2. When you are writing your domain/range, when would you write with brackets?

3. How do you find your local max. and min.?

4. How do you find the increasing section of a graph? The decreasing section?

Find all the listed elements of this graph.



Domain: _____

Range: _____

Increase: _____

Decrease: _____

Max.: _____

Min.: _____

Piecewise Functions

1. $f(x) = \{4x + 5\ if\ x\angle 0$
   $\{4x + 8\ if\ x \geq 0$

a. $f(-1)$
b. $f(-5)$
c. $f(2)$
d. $f(-1)$

Systems of Linear Equations

1. Solve the following with substitution.
   $2x - 3y = -1$
   $y = x + 1$

2. Solve the following with substitution.
   $-3x + 3y = 4$
   $x = y - 3$

3. Solve the following with elimination.
   $-6x + 5y = 1$
   $6x + 4y = -10$

4. Solve the following using elimination.
   $-3x + 7y = -16$
   $-9x + 5y = 16$

5. Put the system of equations into an augmented matrix and then solve for row echelon form.
   $2x + 3y = 7$
   $x - y = 1$

6. Using your calculator, put the system of equations into reduced row echelon form.
   $x + 2y + 3z = 6$
   $2x - 3y + 2z = 14$
   $3x + y - z = -2$