Geometry Lomac 2015-2016 **Date** 10/14 **due** 10/15 **Function Graphs 3.1L**

Name ______________________________ **Per**______

LO: I can identify **inputs, outputs, maximum values, and minimum values** on a function graph.

☐ **DO NOW** On the back of this packet

☐ (1) **Need to Know: Function Inputs, Outputs, Maximum,** and **Minimum** values

Graphs are one of the most powerful ways of visualizing a function's rule because you can quickly read **outputs** given **inputs**. You can also easily see features such as **maximum and minimum** output values. Let's review some of those skills in Exercise #1.

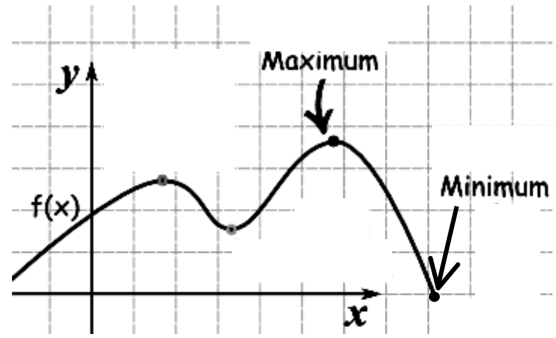
Inputs are x-values

Outputs are y-values

y = f(x) because y-values are the results after performing a function (series of operations) on x-values

maximum is the highest y-value of a function

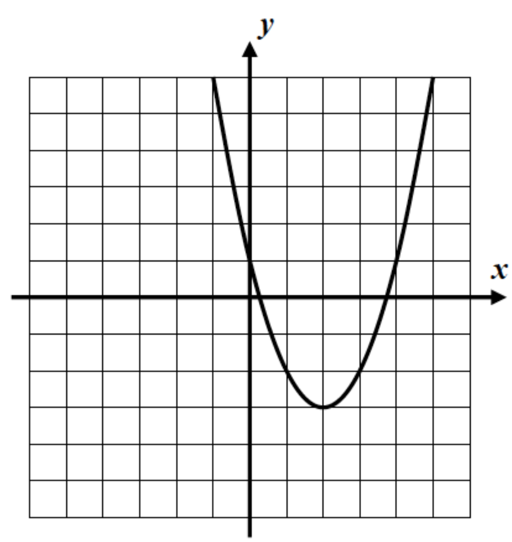
minimum is the lowest y-value of a function



☐ (2) **Function Graphs**

transparencies, dry erase markers, erasers

***Exercise* #1:** Given the function $y = f(x)$ defined by the graph below, answer the following questions.



(a) Find the value of each of the following:

$f(4) =$ $f(-1) =$

(b) For what values of x does $f(x) = -2$? Illustrate on the graph.

(c) State the **minimum** and **maximum values of** the **function**.

(d) How would the **minimum** and/or the **maximum** be different if there were arrows on the graph?

☐ (3) **Functions: finding outputs and graphing**

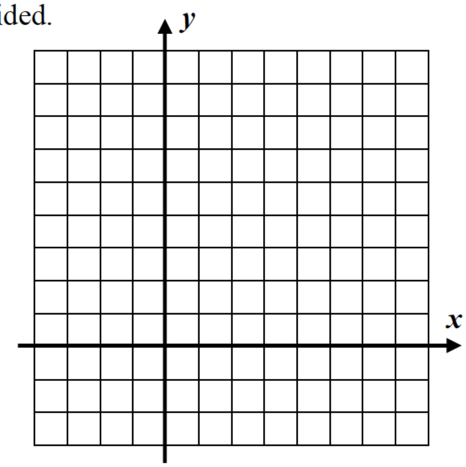
So, if we can read a graph to produce outputs (y-values) if we are given inputs (x-values), then we should be able to reverse the process and produce a graph of the function from its **algebraically expressed rule.**

***Exercise* #2:** Consider the function given by the rule $g(x) = 2x + 3$.

(a) Fill out the table below for the inputs given.

x	$2x+3$	(x, y)
-3		
-2		
-1		
0		
1		
2		
3		

(b) Draw a graph of the function on the axes provided.

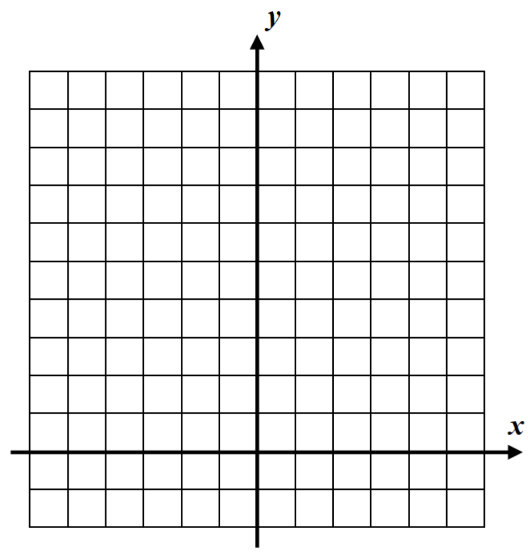


☐ (4) **Functions: finding outputs and graphing**

Never forget that all we need to do to **translate** between an equation and a graph is to **plot** input/output pairs according to whatever rule we are given. Let's look at a simple **non-linear** function next.

***Exercise* #3:** Consider the simplest **quadratic function** $f(x) = x^2$. Fill out the function table below for the inputs given and graph the function on the axes provided.

x	x^2	(x, y)
-3		
-2		
-1		
0		
1		
2		
3		



☐ (5) cont. **Function Graphs: Piecewise**

Sometimes the function's rule gets all sorts of funny and can include being **piecewise defined**. These functions have different rules for different values of x. These separate rules combine to make a larger (and more complicated rule). Let's try to get a feel for one of these.

Exercise #4: Consider the function given by the formula $f(x)=\begin{cases}2x+6 & x<0\\ 6-x & x\geq 0\end{cases}$. Your teacher will help you understand the notation of this function.

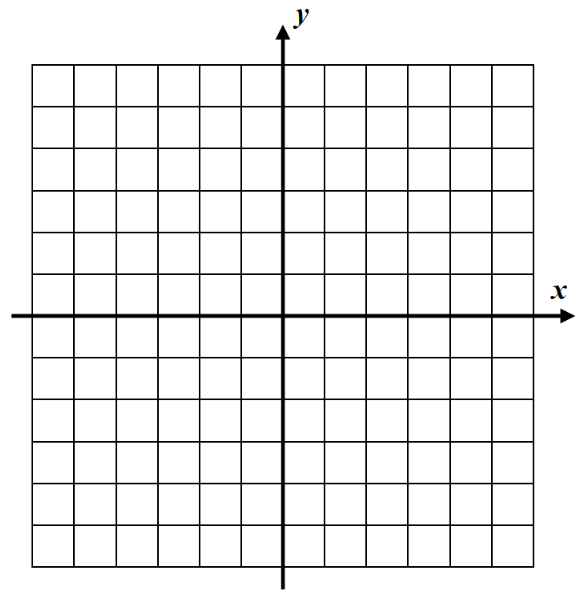
(a) Evaluate each of the following:

$f(4)=$ $\qquad$ $f(-3)=$

(b) Fill out the table below for the inputs given. Keep in mind which formula you are using.

x	Rule/Calculation	(x, y)
-3		
-2		
-1		
0		
1		
2		
3		

(c) Graph $y=f(x)$ on the axes below.



☐ (5) **Exit Ticket**

ON THE LAST PAGE

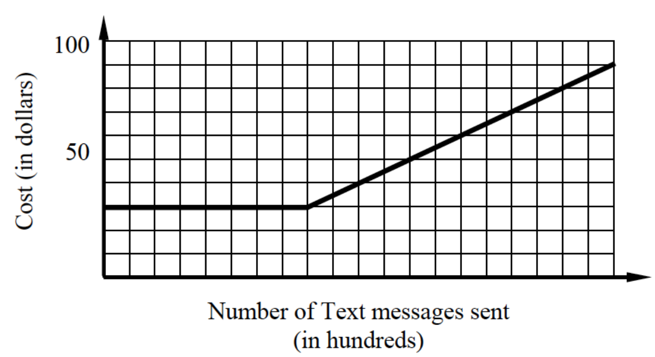
☐ (6) **Homework**

1. The following graph represents the cost of a phone plan after a certain number of text messages used in a month. Analyze the graph to answer the following questions.

(a) How much would you have to pay if you used:

500 text messages ____________

1800 text messages ____________



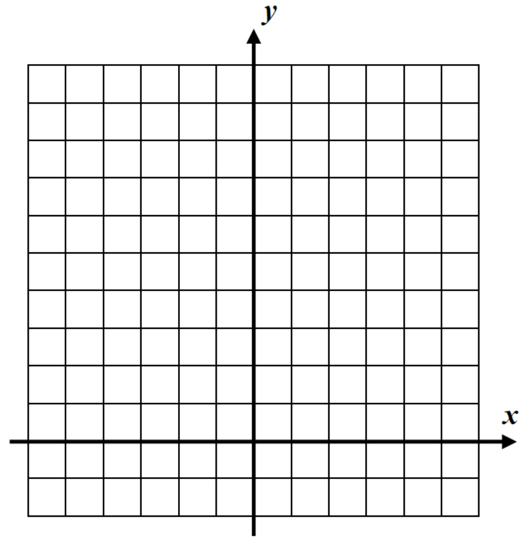
(b) Interpret $f(1400)=60$

(c) What might have caused the graph to begin increasing at 800 text messages?

☐ (4) cont. **Homework**

2. Consider the function $f(x) = 3(2-x)-2$. Fill out the function table below for the inputs given and graph the function on the axes provided.

x	$3(2-x)-2$	(x, y)
-2		
-1		
0		
1		
2		



3. Consider the following relationship given by the formula $f(x) = \begin{cases} 3-2x & x \le 1 \\ 2x-1 & x > 1 \end{cases}$.

(a) Evaluate each of the following:

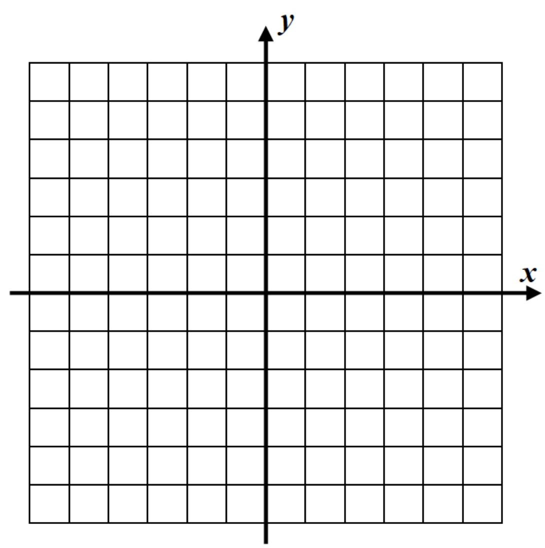
$f(5) =$ $\qquad\qquad$ $f(-2) =$

(b) Carefully evaluate $f(1)$.

(c) Fill out the table below for the inputs given. Keep in mind which formula you are using.

x	Rule/Calculation	(x, y)
-1		
0		
1		
2		
3		

(d) Graph $y = f(x)$ on the axes below.

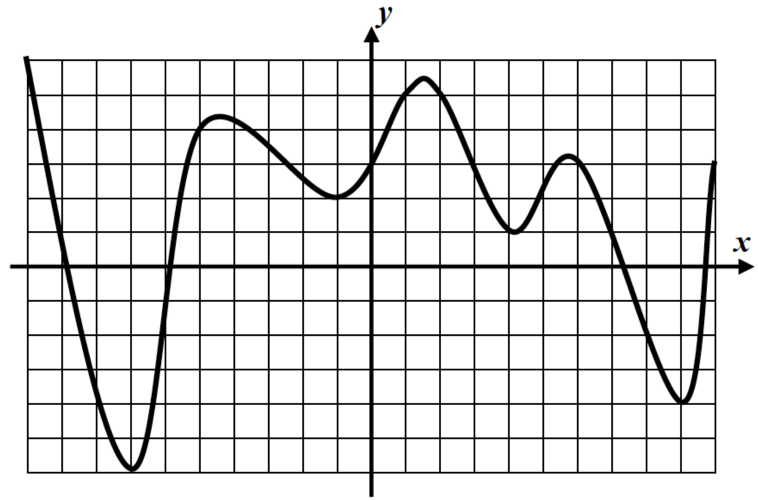


(e) What is the minimum value of the function? Circle the point that indicates this value on the graph.

Exit Ticket **Name**________________________________ **Date** ______ _____ **Per**_ _____ **3.1L**

(1) The LO (Learning Outcomes) are written below your name on the front of this packet. Demonstrate your achievement of these outcomes by doing the following:

Using the graph of the function $f(x)$ shown below, answer the following questions.



(a) Find the value of each of the following:

$f(-7)=$ $f(0)=$

$f(4)=$ $f(9)=$

(b) For how many values of x does $f(x)=5$?
Illustrate on the graph.

(c) What is the y-intercept of this relation?

(d) State the maximum and minimum values the graph obtains.

DO NOW Name________________________________ Date ___________ Per______ 3.1L

(1) Solving progress: Solve one of the two problems below.

(a) $5n + 34 = -2(1 - 7n)$

(b) $-20 = -4x - 6x$

(2) Translation to algebra progress. Write an algebraic statement to represent this situation. Be sure to write a “Let” statement to define any variables.

When you multiply a number *s* by 9 and add 5,
the result is the same as the product of the number *s* and 7.