

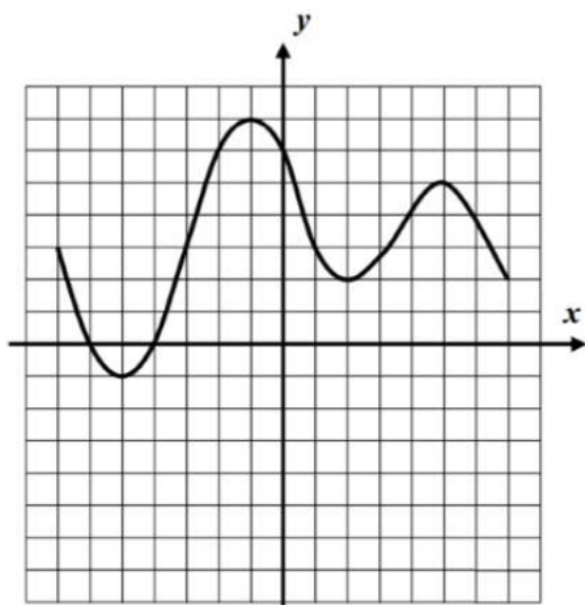
Name: _____ Algebra 9 Unit 3 Lesson 4

Graphical Features

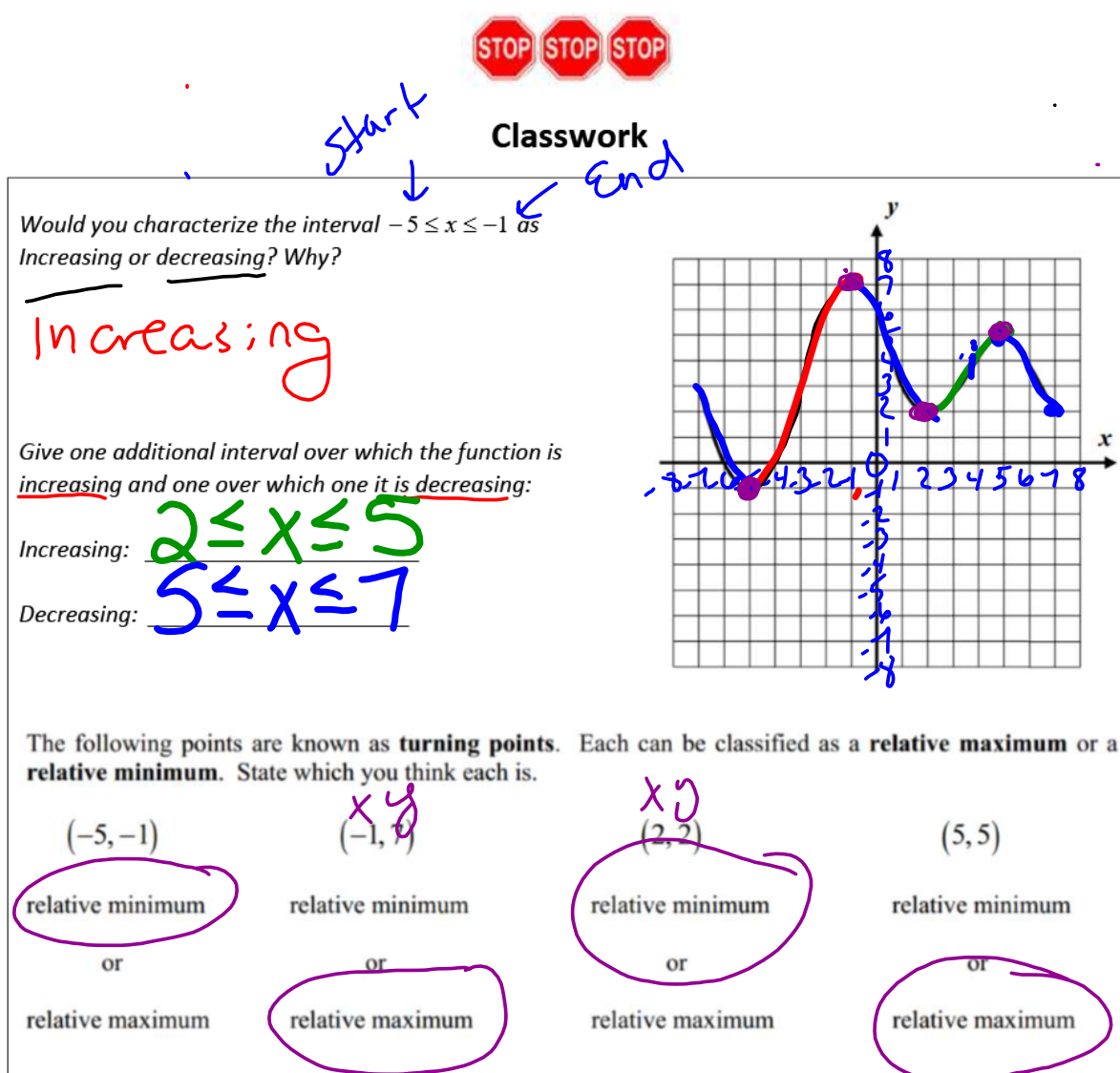
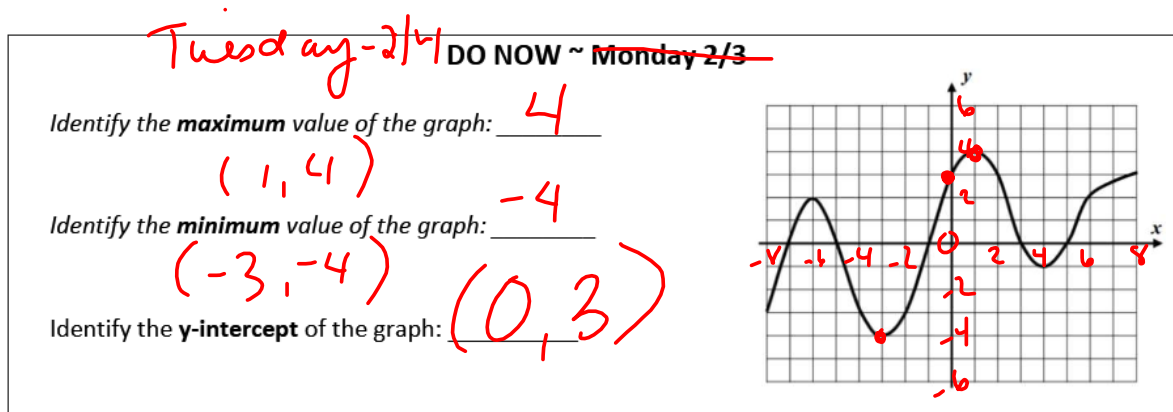
DO NOW ~ Friday 1/31

What do you think the word '**maximum**' means? _____What do you think the word '**minimum**' means? _____

Classwork

The function $y = f(x)$ is shown graphed below over the interval $-7 \leq x \leq 7$.

- a) Find the maximum and minimum values of the function.
- b) What is the y-intercept of the function? Why do you think a function can only have one y-intercept?
- c) Identify the x-intercepts of the function. These are also known as the zeroes.

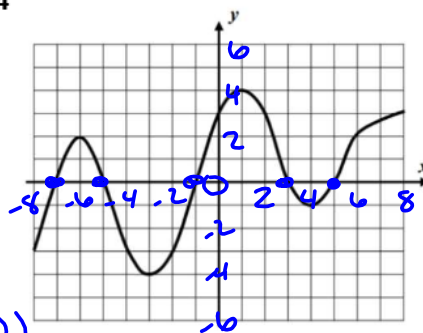


DO NOW ~ Tuesday 2/4

State the Zeroes (x-intercepts) of the following function:

$$x = -7, -5, -1, 3, 5$$

$$(-7, 0) (-5, 0) (-1, 0) (3, 0) (5, 0)$$



Classwork

Use the following Piecewise Function to answer all of the questions below.

$$f(x) = \begin{cases} \frac{1}{3}x + 1, & x < 3 \\ 8 - 2x, & x \geq 3 \end{cases}$$

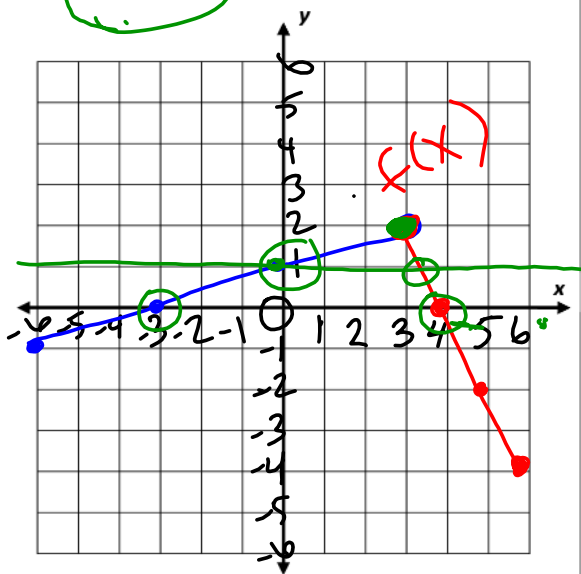
- (a) Create a table of values for this function below over the interval $-6 \leq x \leq 6$. Then create a graph on the axes for this function.

x	Compute $f(x)$	(x, y)
-6	$\frac{1}{3}(-6) + 1$	$(-6, -1)$
-3	$\frac{1}{3}(-3) + 1$	$(-3, 0)$
0	$\frac{1}{3}(0) + 1$	$(0, 1)$
3	$\frac{1}{3}(3) + 1$	$(3, 2)$
3	$8 - 2(3)$	$(3, 2)$
4	$8 - 2(4)$	$(4, 0)$
5	$8 - 2(5)$	$(5, -2)$
6	$8 - 2(6)$	$(6, -4)$

x-intercept

- (b) State the zeroes of the function.

$$x = -3, 4$$

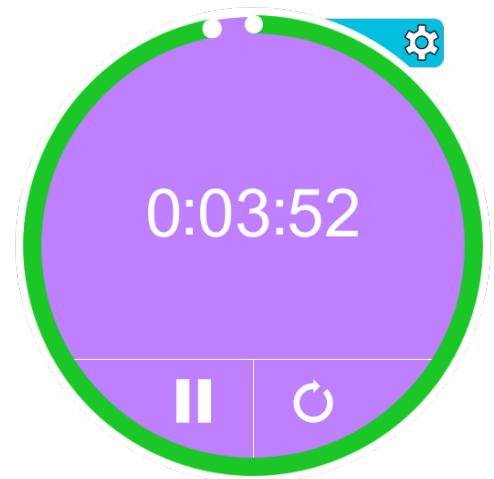


- (c) State the function's y-intercept.

$$(0, 1)$$

To earn your full participation point for the Do Now be sure to have completed all of the following by the time is up:

- 1) Be in your seat
- 2) Take out your calculator
- 3) Have last night's homework out
- 4) Complete the do now



DO NOW ~ Wednesday 2/5

Evaluate each of the following:

$f(-2) = -3$

$f(4) = -1$

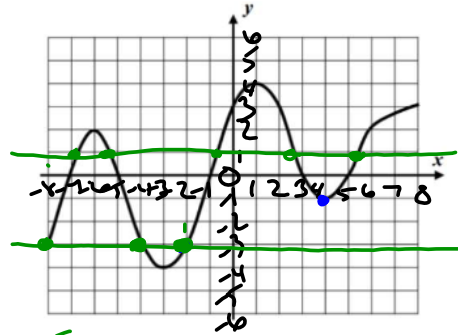
Determine the input for the given outputs:

$f(x) = 1$

$f(x) = -3$

$y = 1$
 $x =$
Inputs

$y = -3$
 $x = -8, -4, -2$



Classwork

Use the graph from Tuesday's classwork to answer the following questions.

- (d) Give the interval over which the function is increasing. Give the interval over which it is decreasing.

Increasing: $-6 \leq x \leq 3$
 Decreasing: $3 \leq x \leq 6$

- (e) Give the coordinates of the one turning point and classify it as either a relative maximum or relative minimum.

max x, y
 $(3, 2)$

- (f) Use your graph to find all solutions to the equation $f(x) = 1$. Illustrate your solution graphically. One solution may contain a decimal.

$y = 1$
 2 solutions.

- (g) State the interval over which this function is positive. How can you tell this quickly from the graph?

$-3 \leq x \leq 4$

Mrs. Ferreri's Station ~ Graphical Features

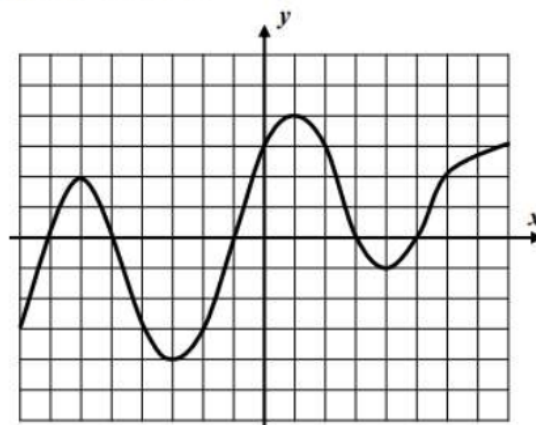
1. The function $y = f(x)$ is shown graphed below over the interval $-8 \leq x \leq 8$.

(a) Evaluate each of the following;

$$f(-2) = \quad \quad \quad f(8) =$$

$$f(-8) = \quad \quad \quad f(4) =$$

(b) Find all the relative maximum and minimum values of the function. State the values of x where they occur as well.



(c) What are the absolute maximum and absolute minimum values of the function? At what x -values do they occur?

(d) What are the x and y -intercept(s) of the function? List each of the following as an ordered pair (x, y) .

x -intercept(s): _____ y -intercept(s): _____
(zeroes)

(e) Give an interval over which the function is increasing. Give an interval over which it is decreasing.

Increasing: _____

Decreasing: _____

(f) Use your graph to find all solutions to the equation $f(x) = 3$. Illustrate your solution graphically.

(g) Is the function positive or negative on the interval $-1 < x < 3$? How can you quickly tell?

Continue onto next page.

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

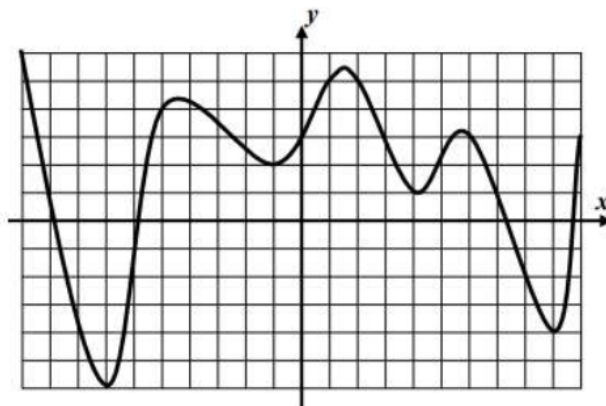
(a) Find the value of each of the following:

$$f(-7) =$$

$$f(0) =$$

$$f(4) =$$

$$f(9) =$$



(b) For how many values of x does $f(x) = 5$?

Illustrate on the graph.

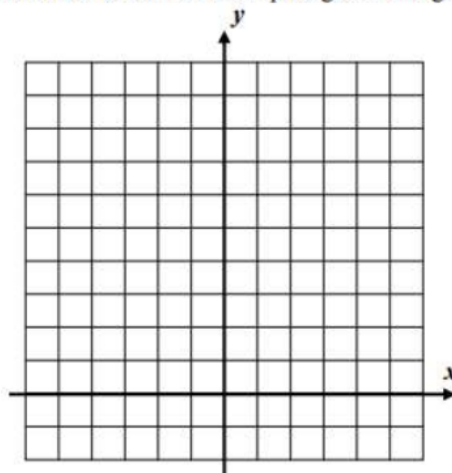
(c) What is the y-intercept of this relation?

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

(e) Explain why the graph above represents a function.

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		

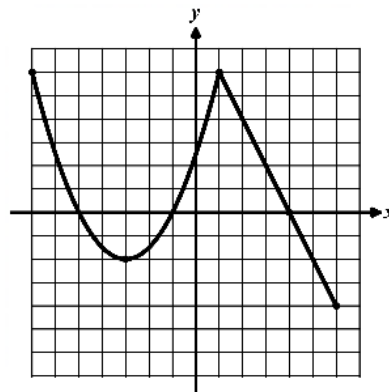


Chromebook Station ~ *Delta Math*

Complete the “Evaluating Functions using Graphs” assignment.

Mrs. Kennedy's Station ~ More Graphical Features

The function $y = f(x)$ is shown graphed below over the interval $-7 \leq x \leq 6$.



(a) Evaluate each of the following;

$$f(-7)$$

$$f(6)$$

(b) Find all the relative maximum and minimum values of the function. State the values of x where they occur as well.

(c) From your answers stated in (b), what is the Absolute Minimum value?

(d) What are the x and y -intercept(s) of the function? List each of the following as an ordered pair (x, y) .

x -intercept(s): _____

y -intercept(s) (estimate): _____

(zeroes)

(e) Give an interval (always in terms of x) for which the function is increasing. Give an interval over which it is decreasing.

Increasing: _____

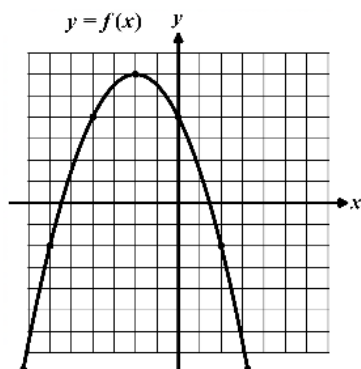
Decreasing: _____

(f) Use your graph to find all solutions to the equation $f(x) = -2$. Illustrate your solution graphically.

(g) Is the function positive or negative on the interval $-5 < x < -1$? How can you quickly tell?

Continue onto the next page.

The function $f(x)$ is shown graphed below:



The function $g(x)$ is defined by the formula:

$$g(x) = -3f(x) + 1$$

Answer each of the following:

A) Is $f(x)$ a function? Why/why not?

B) What is the y-intercept for $f(x)$?

C) What values of x satisfy the equation $f(x) = 4$?

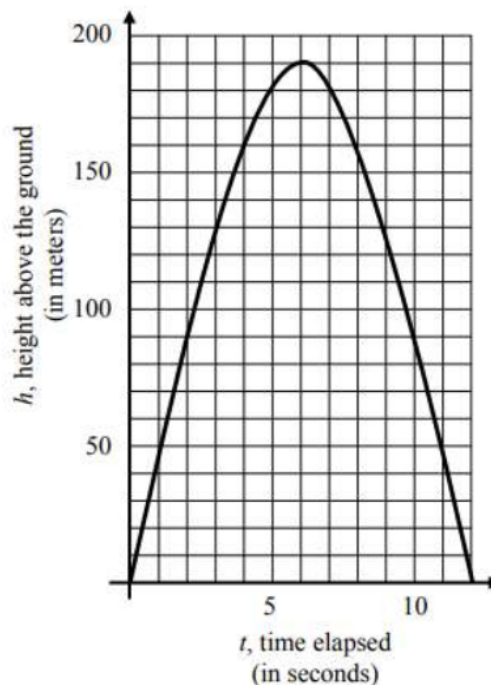
D) What is the value of the Absolute Maximum for $f(x)$?

E) What is the value of $g(-7)$? Show the calculations that lead to your answer.

Continue onto next page.

The following graph shows the height, h , above the ground of a toy rocket t seconds after it was fired. Use the graph of $h(t)$ to answer the following questions.

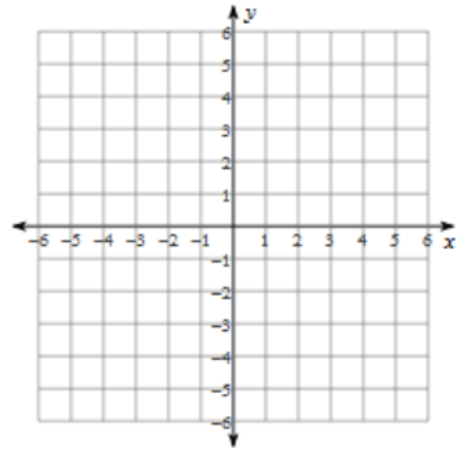
- (a) What was the maximum height the rocket reached?
After how many seconds?
- (b) How many seconds was the rocket in flight?
- (c) Interpret $h(2) = 90$.
- (d) Give the interval for t over which the height of the rocket is decreasing.



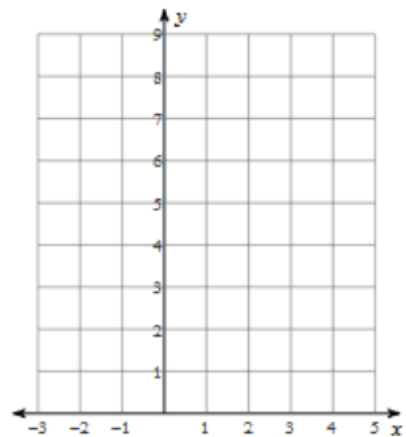
Independent Station ~ Graphing Functions

Graph the following linear and quadratic functions using the TABLE and LABEL method.

1) $y = -2x + 1$



2) $y = (x + 1)^2 + 4$



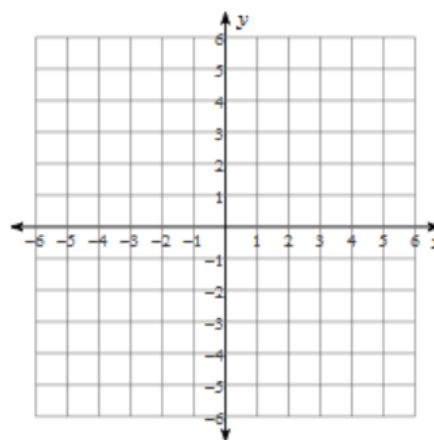
State the minimum value: _____

Is there an x-intercept? If so, where? _____

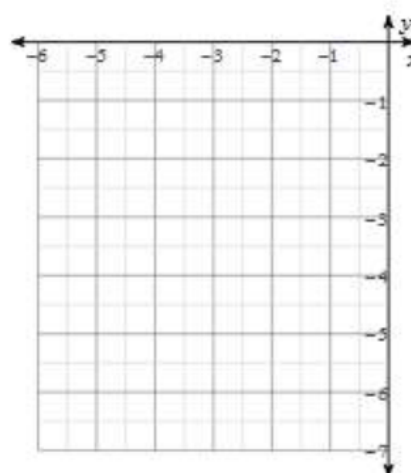
Is there a y-intercept? If so, where? _____

Continue onto the next page

3) $y = -\frac{3}{5}x - 1$



4) $y = -(x+2)^2 - 2$



State the maximum value: _____

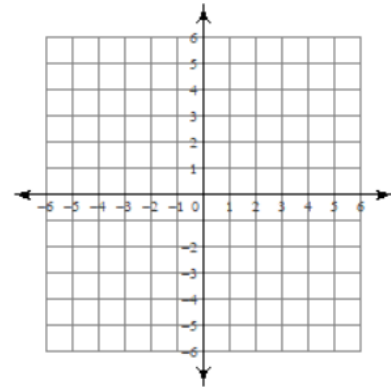
Is there an x-intercept? If so, where? _____

Is there a y-intercept? If so, where? _____

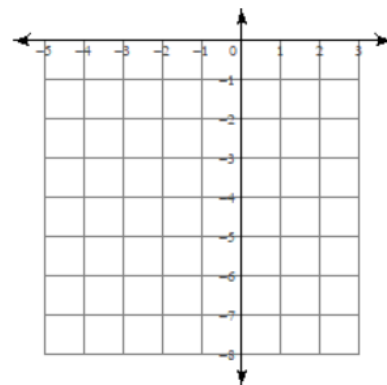
Continue onto next page.

Graph the following linear and quadratic functions using the TABLE and LABEL method.

5) $y = \frac{7}{3}x + 5$



6) $y = -x^2 - 4x - 7$



State the absolute maximum point: _____

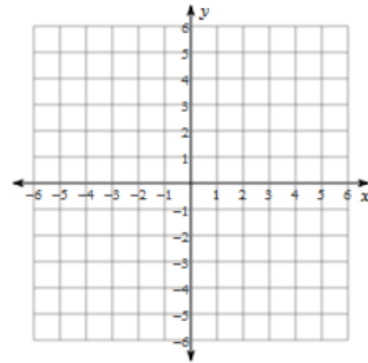
State the y- intercept: _____

Explain why this quadratic function is a function: _____

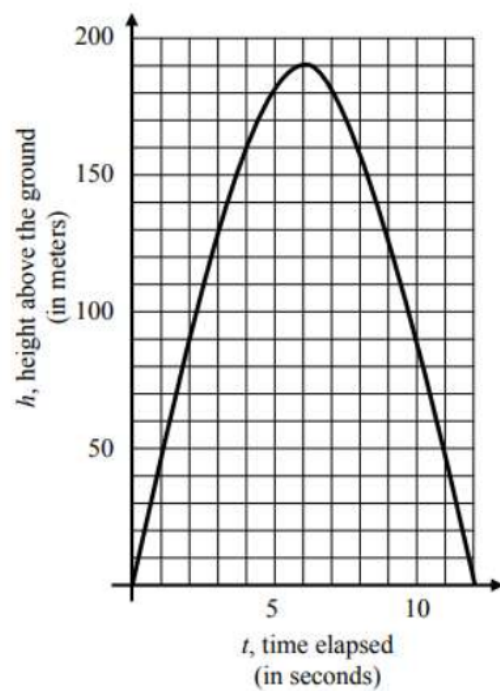
Homework ~ Monday 2/3

Use your calculator to do the **table** and **label** method to graph the following function.

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



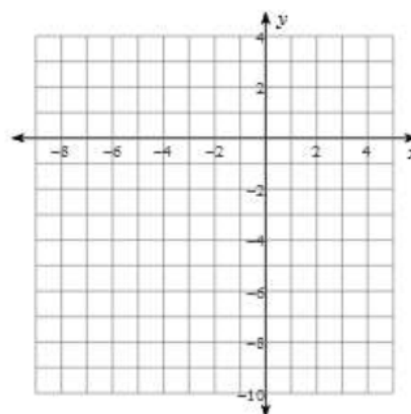
State the **minimum** and **maximum** values of the function.



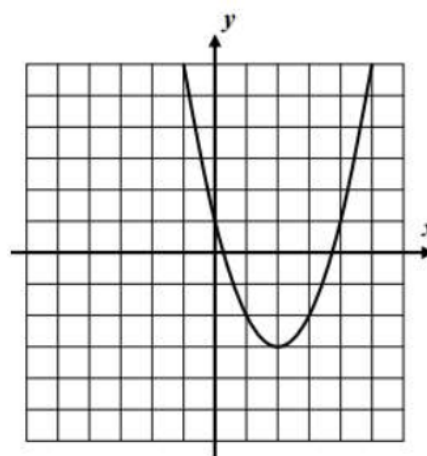
Homework ~ Tuesday 2/4

Use your calculator to do the **table** and **label** method to graph the following function.

$$y = -3(x+1)^2 + 3$$

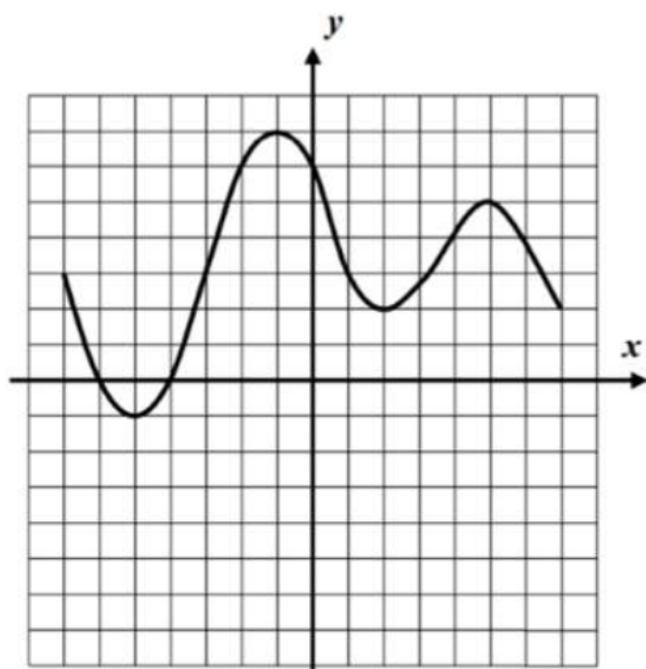


State the **minimum** and **maximum** values of the function.



Homework ~ Wednesday 2/5

The function $y = f(x)$ is shown graphed below over the interval $-7 \leq x \leq 7$.



Give an interval where the function is increasing: _____

Give an interval where the function is decreasing: _____

Evaluate the following:

$$f(x) = 1$$

$$f(1) =$$