

Name: _____

Date: _____

GRAPHICAL FEATURES AND TERMINOLOGY COMMON CORE ALGEBRA I



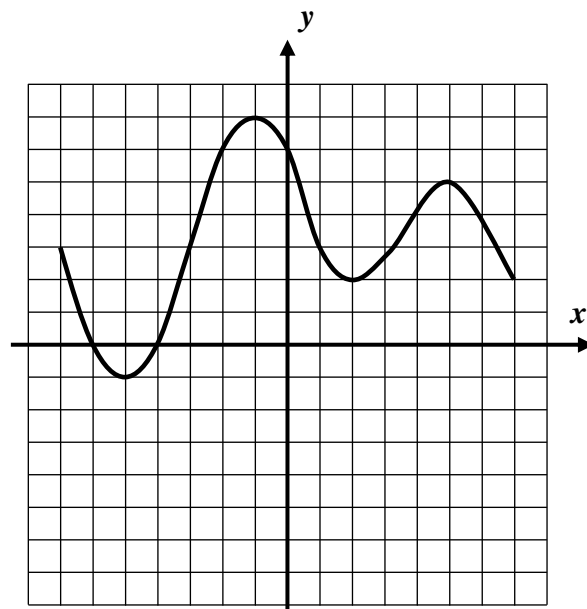
There is a lot of terminology associated with the **graph of a function**. Many of the terms have names that are descriptive, but still, work is needed to master the ideas.

Exercise #1: 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.
State the values of x where they occur as well.

- (b) What is the y -intercept of the function? Explain why a function cannot have more than one y -intercept.

- (c) Give the x -intercepts of the function. These are also known as the function's **zeroes** because they are where $f(x) = 0$.



- (d) Would you characterize the function as **increasing or decreasing** on the domain interval $-5 \leq x \leq -1$? Explain your choice.

- (e) one additional interval over which the function is increasing and one over which it is decreasing.

Increasing: _____

Decreasing: _____

- (f) The following points are known as **turning points**. Each can be classified as a **relative maximum** or a **relative minimum**. State which you think each is.

$(-5, -1)$

$(-1, 7)$

$(2, 2)$

$(5, 5)$

relative minimum

relative minimum

relative minimum

relative minimum

or

or

or

or

relative maximum

relative maximum

relative maximum

relative maximum

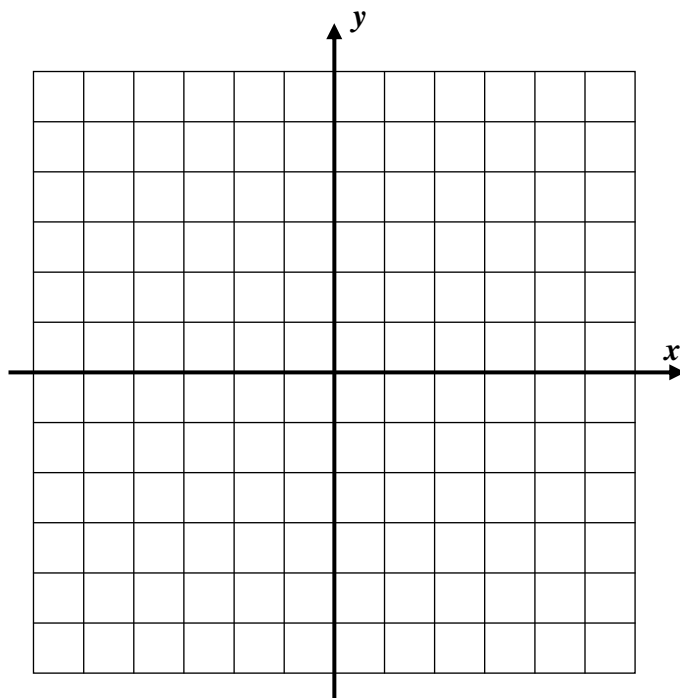


Let's get some more practice with **piecewise defined functions** and mix in our **function terminology** while we are at it.

Exercise #2: Consider the **piecewise linear** function given the equation $f(x) = \begin{cases} x+3 & x \leq 1 \\ 6-2x & x \geq 1 \end{cases}$.

- (a) Create a table of values for this function below over the interval $-4 \leq x \leq 4$. Then create a graph on the axes for this function.

x	Rule/Calculation	(x, y)
-4		
-3		
-2		
-1		
0		
1		
2		
3		
4		



- (b) State the **zeroes of the function**.

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

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

Increasing: _____

Decreasing: _____

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

- (f) Use your graph to find all solutions to the equation $f(x) = 2$. Illustrate your solution graphically and find evidence in the table you created.

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



GRAPHICAL FEATURES

COMMON CORE ALGEBRA I HOMEWORK

FLUENCY

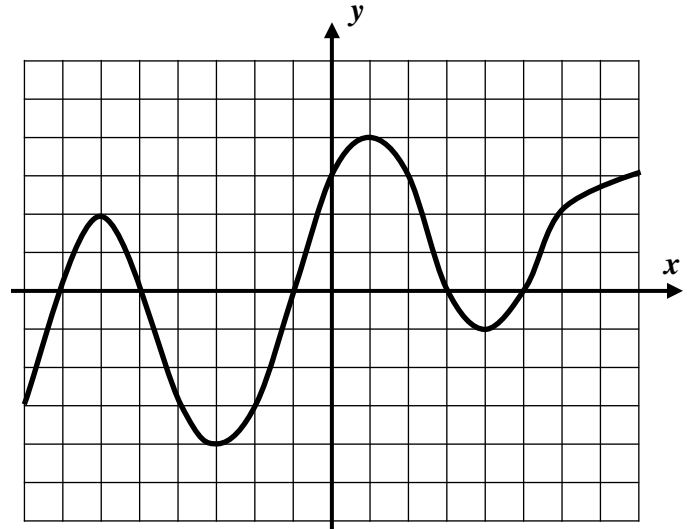
1. The function $y = f(x)$ is shown graphed below over the interval $-8 \leq x \leq 8$.

(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): _____
(zeroes)

y -intercept(s): _____

(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?



APPLICATIONS

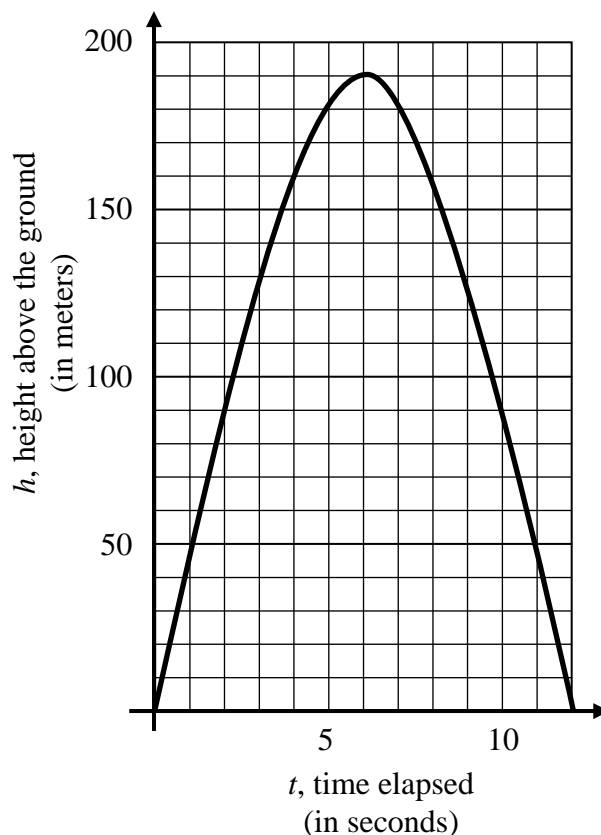
2. The following graph shows the height, h , above the ground of a toy rocket t seconds after it was fired. Use the graph of $h(t)$ to answer the following questions.

(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.



REASONING

3. On the following set of axis, create the graph of a function $f(x)$ with the following characteristics:

Passes through the points,

$(-8,0)$, $(5,-2)$ and $(8,3)$

Has an absolute maximum at $f(-4) = 5$

Has an absolute minimum at $f(2) = -6$

Decreasing on the interval on the interval $-4 \leq x \leq 2$

