

Name: _____

Date: _____

THE DOMAIN AND RANGE OF A FUNCTION

COMMON CORE ALGEBRA I



Ultimately, all functions do is convert inputs into outputs. So, each function has two **sets** associated with it. Those things that serve as **inputs** and those things that serve as **outputs**. These sets are given names.

THE DOMAIN AND RANGE OF A FUNCTION

1. The **domain of a function** is the set of **all inputs** for which the function rule can give an output.
2. The **range of a function** is the **set of all outputs** for which there is an input that results in them.

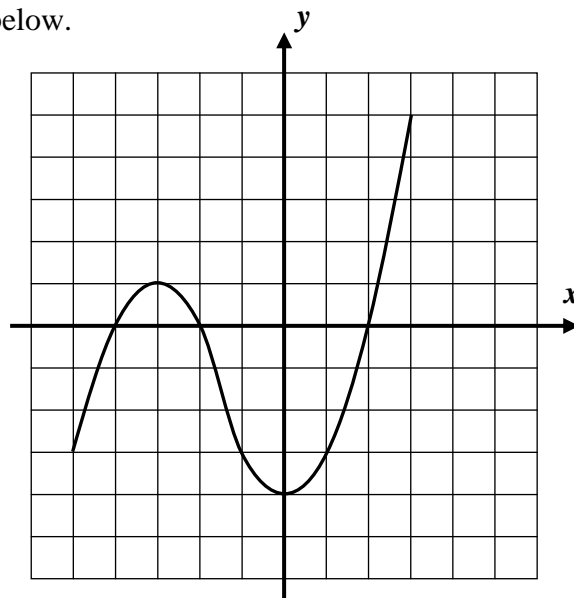
Exercise #1: Consider the function $y = f(x)$ shown on the graph below.

- (a) Evaluate each of the following:

$$f(-3) = \quad f(1) = \quad f(3) =$$

- (b) Can the function rule, given by the graph, give you a value when $x = 5$? If so, what is it? If not, why not?

- (c) Is $x = 5$ in the **domain** of the function?



- (d) Give two other values of x that are **not** in the **domain** of the function.

- (e) Circle the following y -values that are in the **range** of the function? Show evidence on your graph.

$$y = 0$$

$$y = 6$$

$$y = -1$$

$$y = 3$$

$$y = -5$$

$$y = 4$$

- (f) Write the domain and range of this function using a single inequality.

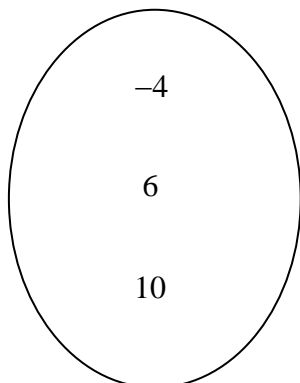
DOMAIN

RANGE

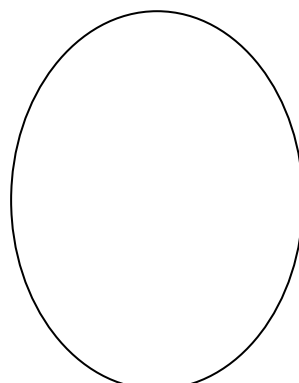


Exercise #2: Given the function $f(x) = \frac{x}{2} - 3$ and the domain shown below, fill in the range. Write the set in roster notation.

Domain



Range



Range: _____

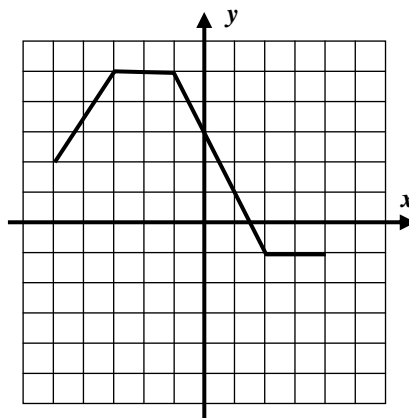
Exercise #3: Which of the following values is *not* in the domain of the function $f(x)$ shown below? Illustrate your thinking by marking points on the graph.

(1) -3

(3) 5

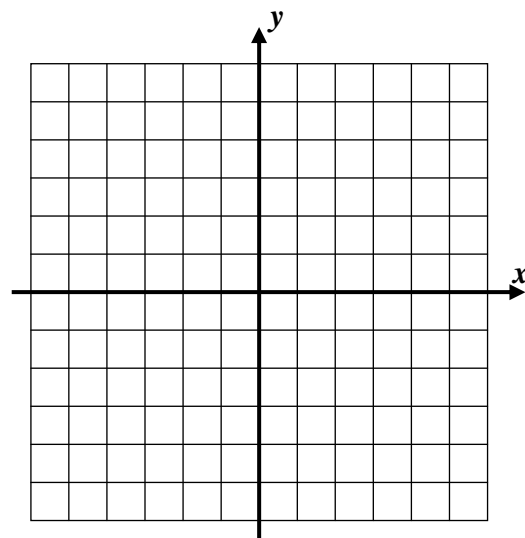
(2) -4

(4) 0



Exercise #4: Consider the piecewise linear function given by the formula $f(x) = \begin{cases} -\frac{(x+2)}{2} & -4 \leq x \leq 2 \\ 4x-10 & 2 \leq x \leq 4 \end{cases}$.

Determine the function's range.



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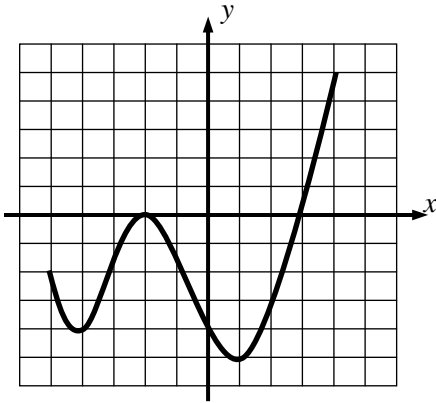
THE DOMAIN AND RANGE OF A FUNCTION

COMMON CORE ALGEBRA I HOMEWORK

FLUENCY

1. In each of the following, state the domain and range; then decide if it's a function or not. Be sure to explain using words such as input, output, domain and range!

(a)



Domain: _____

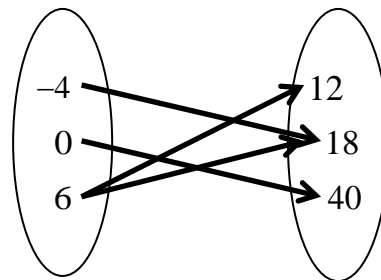
Range: _____

Function (yes/no):

(b)

Domain

Range

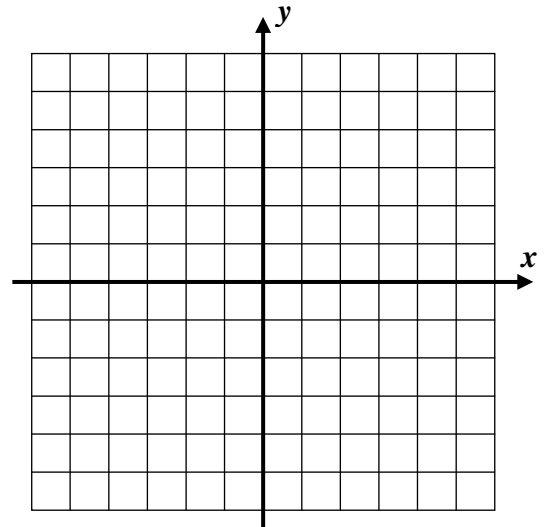


Domain: _____

Range: _____

Function (yes/no):

2. Consider the piecewise linear function given by the formula $f(x) = \begin{cases} 2-3x & -1 \leq x \leq 1 \\ x-2 & 1 < x \leq 3 \end{cases}$. Determine the function's domain and range. Draw a graph of the function to fully justify your answer. Use tables on your calculator to help graph.

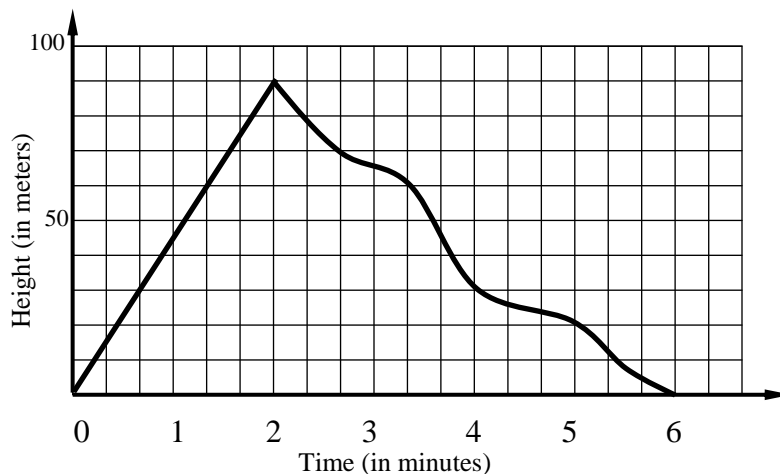


APPLICATIONS

3. The following graph represents the height above the ground versus time at a resort as Thomas rides his favorite ski slope.

(a) State the domain and, in your own words, what the domain represents.

(b) State range and, in your own words, what the range represents.



(c) What might Thomas have been doing for the interval $0 \leq t \leq 2$? What was his average rate of change? Use proper units in your answer.

(d) What might Thomas have been doing for the interval $2 \leq t \leq 6$? What was his average rate of change? Use proper units in your answer and compare to what you found in (c).

REASONING

4. The graph below represents the height of a ball over the interval $0 \leq t \leq 8$. After how many seconds was the ball 12 feet off of the ground? Explain your answer.

What does your answer indicate about the **range** of this function?

