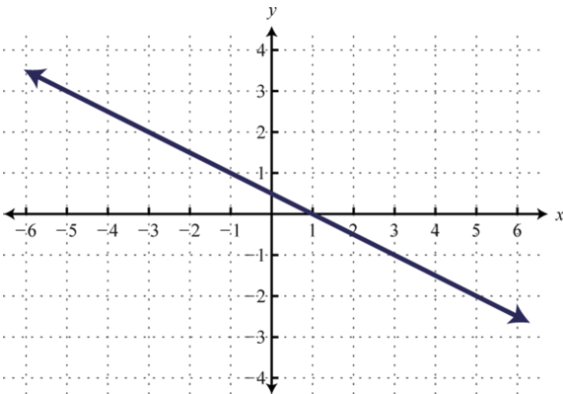


## Characteristics of Linear Functions

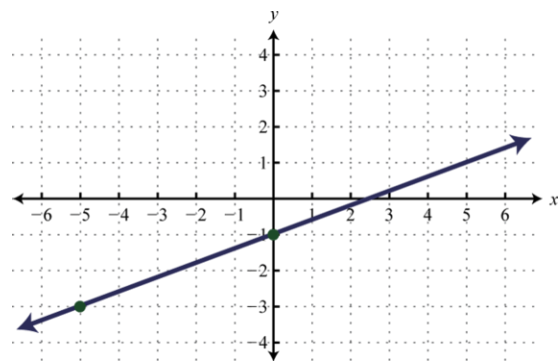
## Domain and Range

Domain		
<b>Define:</b> All possible values of $x$	<b>Think:</b> How far left to right does the graph go?	<b>Write:</b>
Range		
<b>Define:</b> All possible values of $y$	<b>Think:</b> How far down to how far up does the graph go?	<b>Write:</b>



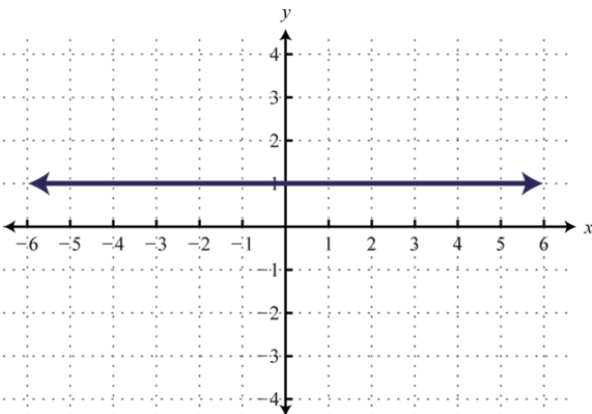
Domain:

Range:



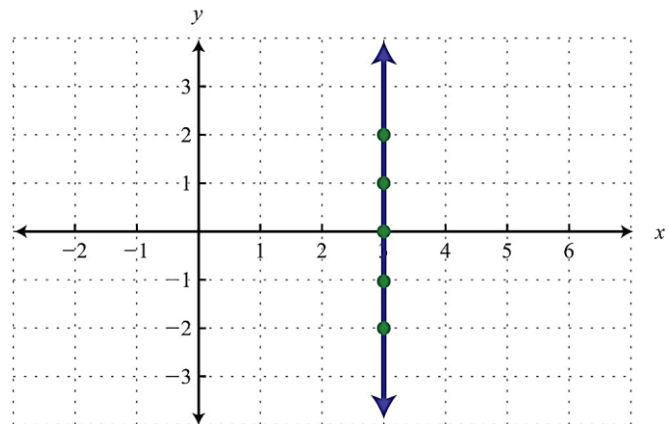
Domain:

Range:



Domain:

Range:



Domain:

Range:

## Zeros and Intercepts

### Y-Intercept

**Define:**  
Point where the graph crosses the y-axis

**Think:**  
At what coordinate point does the graph cross the y-axis?

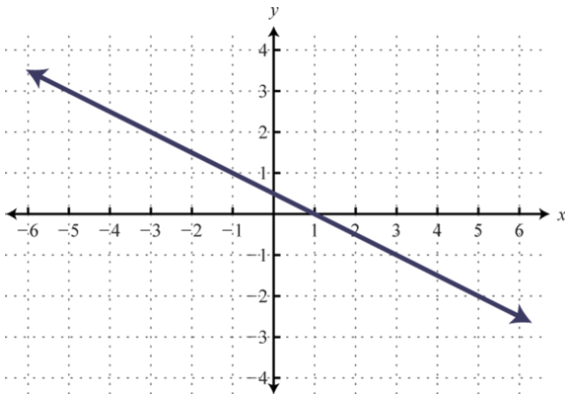
**Write:**

### X-Intercept

**Define:**  
Point where the graph crosses the x-axis

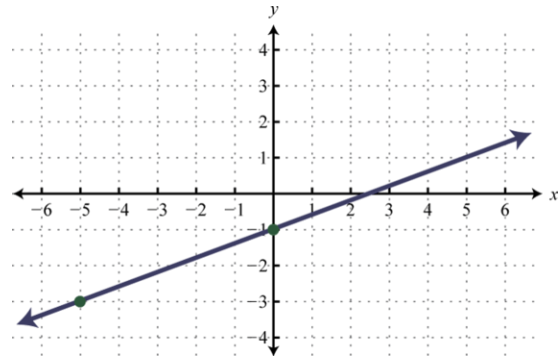
**Think:**  
At what coordinate point does the graph cross the x-axis?

**Write:**



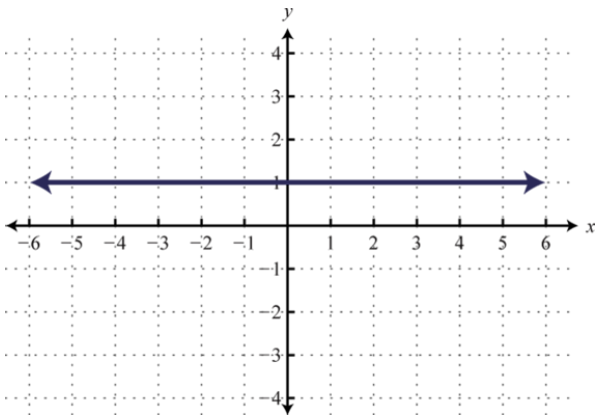
X-intercepts:

Y-intercept:



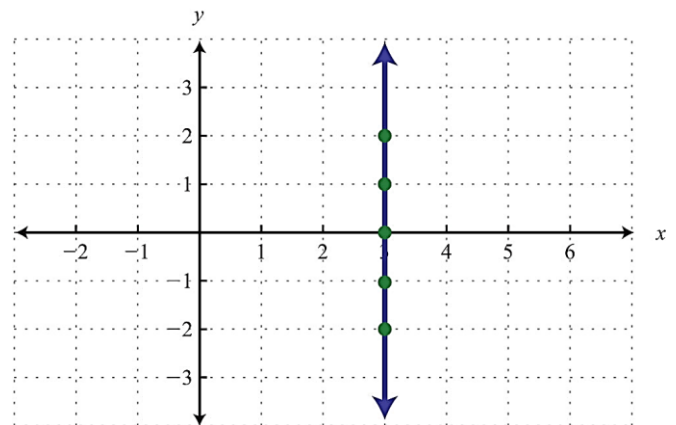
X-intercepts:

Y-intercept:



X-intercepts:

Y-intercept:



X-intercepts:

Y-intercept:

<b>End Behavior</b>
---------------------

<b>End Behavior</b>
---------------------

<b>Define:</b>
----------------

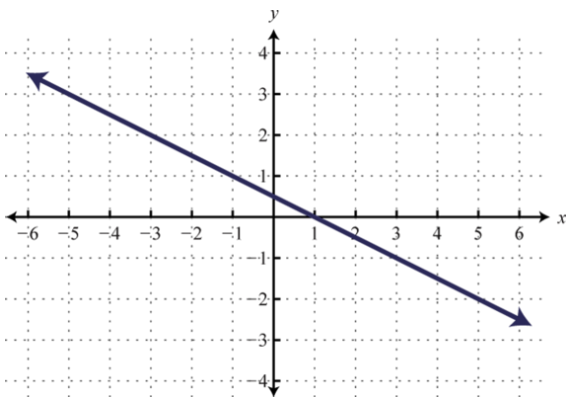
Behavior of the ends of the function (what happens to the y-values or $f(x)$ ) as $x$ approaches positive or negative infinity. The arrows indicate the function goes on forever so we want to know where those ends go.
--

<b>Think:</b>	<b>Write:</b>
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As $x$ goes to the left (negative infinity), what direction does the left arrow go?	
---	--

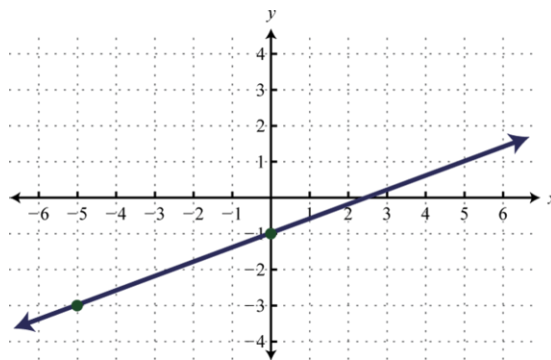
<b>Think:</b>	<b>Write:</b>
---------------	---------------

As $x$ goes to the right (positive infinity), what direction does the right arrow go?	
---	--



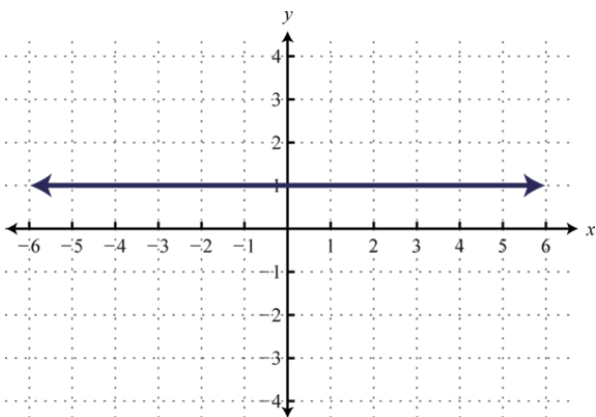
As  $x \rightarrow -\infty, f(x) \rightarrow$  \_\_\_\_\_.

As  $x \rightarrow \infty, f(x) \rightarrow$  \_\_\_\_\_.



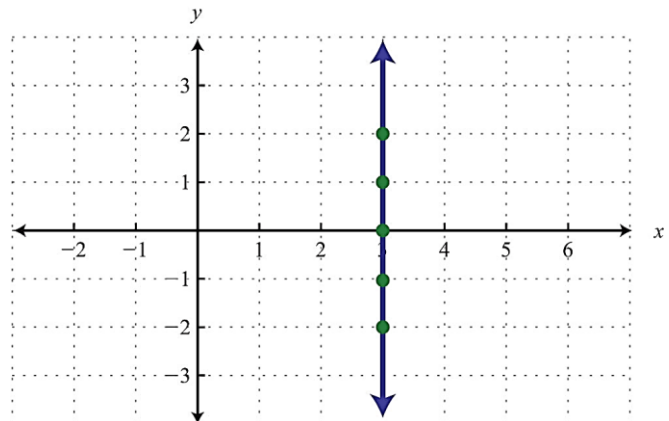
As  $x \rightarrow -\infty, f(x) \rightarrow$  \_\_\_\_\_.

As  $x \rightarrow \infty, f(x) \rightarrow$  \_\_\_\_\_.



As  $x \rightarrow -\infty, f(x) \rightarrow$  \_\_\_\_\_.

As  $x \rightarrow \infty, f(x) \rightarrow$  \_\_\_\_\_.



As  $x \rightarrow -\infty, f(x) \rightarrow$  \_\_\_\_\_.

As  $x \rightarrow \infty, f(x) \rightarrow$  \_\_\_\_\_.

## Average Rate of Change

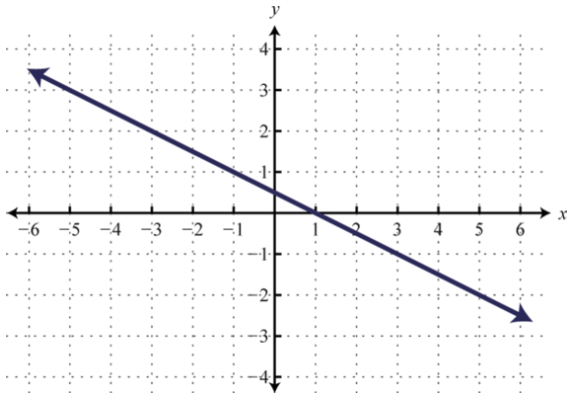
### Average Rate of Change

**Define:**

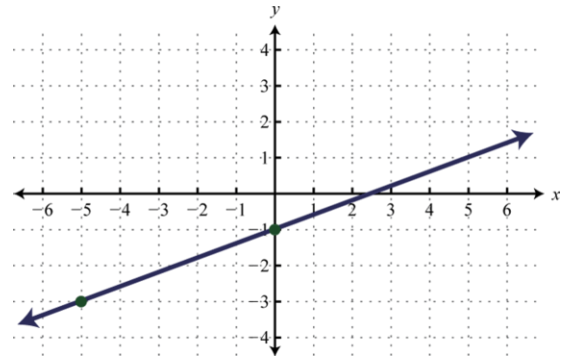
Rate of change or slope for a given interval on a graph

**Think:**

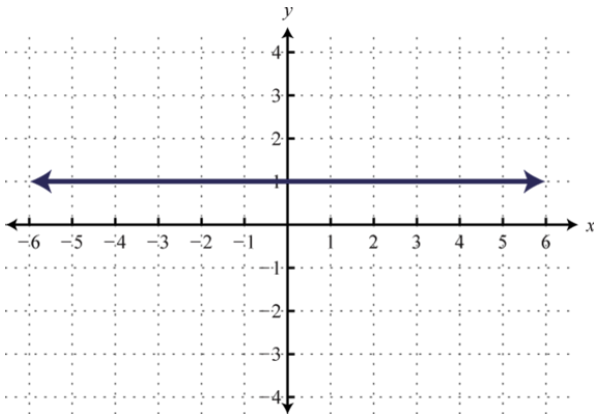
How is the graph changing over the given interval?

**Write:**


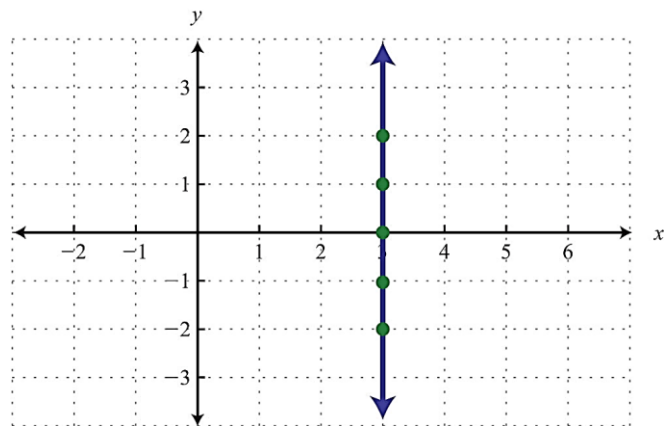
Calculate the average rate of change for the interval  $-3 \leq x \leq 3$ .



Calculate the average rate of change for the interval  $-5 \leq x \leq -1$ .



A horizontal line has a slope of \_\_\_\_\_.

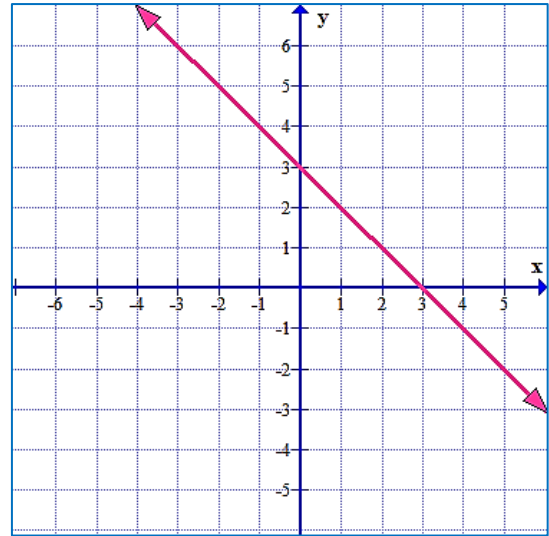


A vertical line has a slope of \_\_\_\_\_.

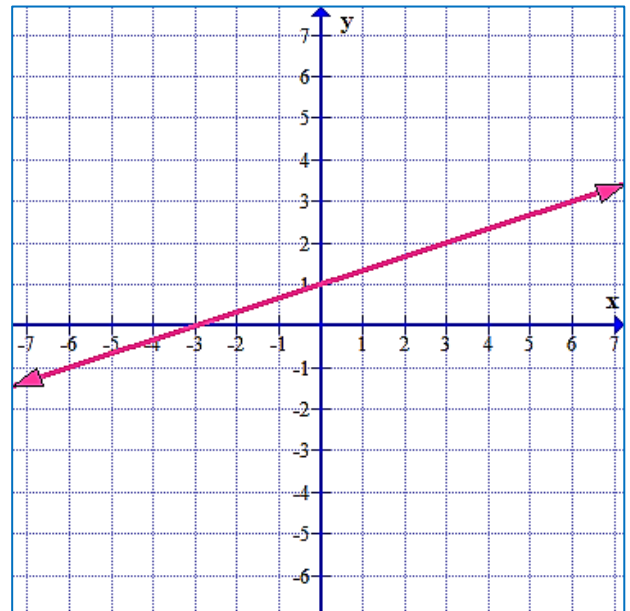
Calculate the average rate of change for the function  $f(x) = 3x$  for the interval  $1 \leq x \leq 3$ .

## Characteristics of Linear Functions Practice

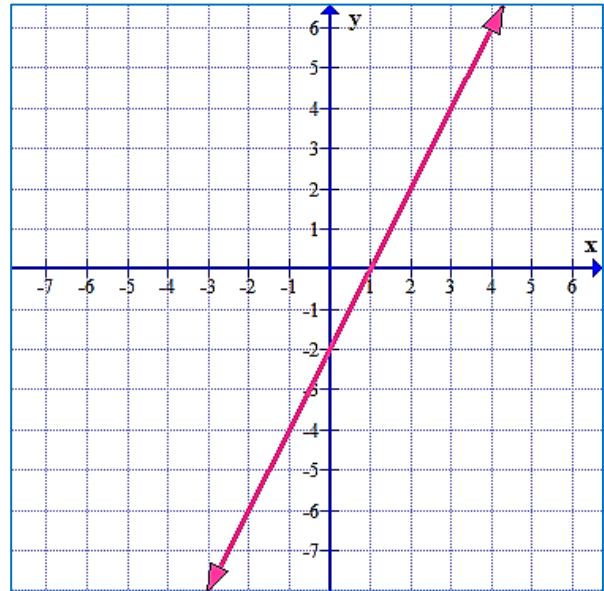
- 1) Domain: \_\_\_\_\_  
 Range: \_\_\_\_\_  
 X-Intercept: \_\_\_\_\_  
 Y-Intercept: \_\_\_\_\_  
 Increasing: \_\_\_\_\_  
 Decreasing: \_\_\_\_\_  
 Constant: \_\_\_\_\_  
 Slope: \_\_\_\_\_  
 As  $x \rightarrow -\infty, f(x) \rightarrow$  \_\_\_\_\_.  
 As  $x \rightarrow \infty, f(x) \rightarrow$  \_\_\_\_\_.  
 Equation: \_\_\_\_\_



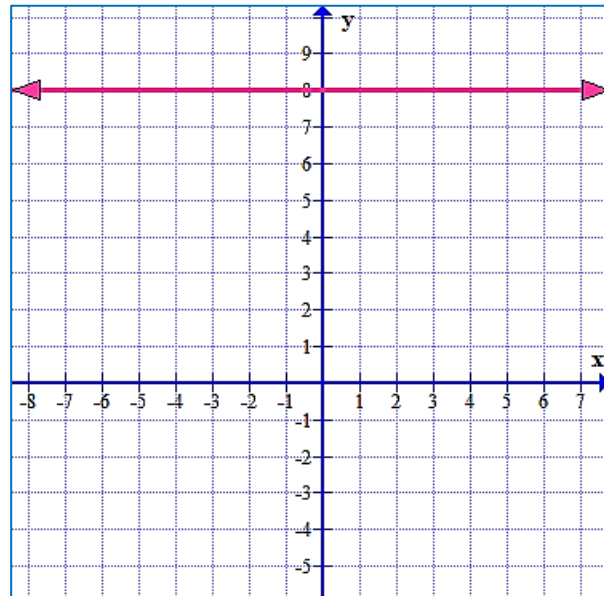
- 2) Domain: \_\_\_\_\_  
 Range: \_\_\_\_\_  
 X-Intercept: \_\_\_\_\_  
 Y-Intercept: \_\_\_\_\_  
 Increasing: \_\_\_\_\_  
 Decreasing: \_\_\_\_\_  
 Constant: \_\_\_\_\_  
 Slope: \_\_\_\_\_  
 As  $x \rightarrow -\infty, f(x) \rightarrow$  \_\_\_\_\_.  
 As  $x \rightarrow \infty, f(x) \rightarrow$  \_\_\_\_\_.  
 Equation: \_\_\_\_\_



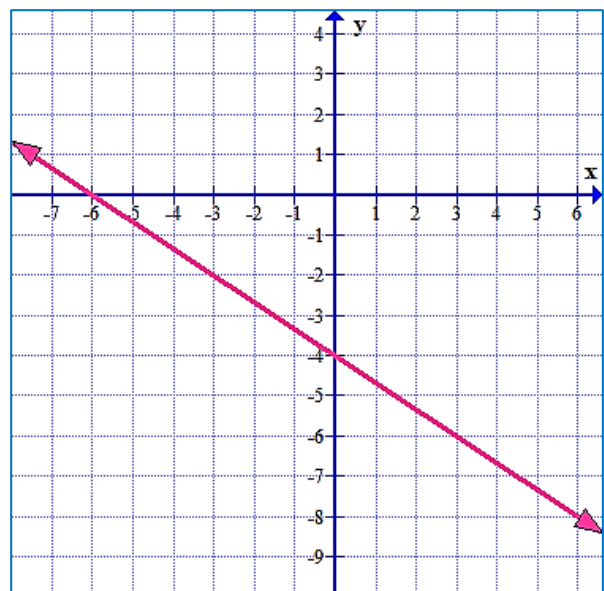
- 3) Domain: \_\_\_\_\_  
 Range: \_\_\_\_\_  
 X-Intercept: \_\_\_\_\_  
 Y-Intercept: \_\_\_\_\_  
 Increasing: \_\_\_\_\_  
 Decreasing: \_\_\_\_\_  
 Constant: \_\_\_\_\_  
 Slope: \_\_\_\_\_  
 As  $x \rightarrow -\infty, f(x) \rightarrow$  \_\_\_\_\_.  
 As  $x \rightarrow \infty, f(x) \rightarrow$  \_\_\_\_\_.  
 Equation: \_\_\_\_\_



- 4) Domain: \_\_\_\_\_  
 Range: \_\_\_\_\_  
 X-Intercept: \_\_\_\_\_  
 Y-Intercept: \_\_\_\_\_  
 Increasing: \_\_\_\_\_  
 Decreasing: \_\_\_\_\_  
 Constant: \_\_\_\_\_  
 Slope: \_\_\_\_\_  
 As  $x \rightarrow -\infty, f(x) \rightarrow$  \_\_\_\_\_.  
 As  $x \rightarrow \infty, f(x) \rightarrow$  \_\_\_\_\_.  
 Equation: \_\_\_\_\_



- 5) Domain: \_\_\_\_\_  
 Range: \_\_\_\_\_  
 X-Intercept: \_\_\_\_\_  
 Y-Intercept: \_\_\_\_\_  
 Increasing: \_\_\_\_\_  
 Decreasing: \_\_\_\_\_  
 Constant: \_\_\_\_\_  
 Slope: \_\_\_\_\_  
 As  $x \rightarrow -\infty, f(x) \rightarrow$  \_\_\_\_\_.  
 As  $x \rightarrow \infty, f(x) \rightarrow$  \_\_\_\_\_.  
 Equation: \_\_\_\_\_



6) Graph  $y = 2x - 2$  and identify the characteristics.

Domain: \_\_\_\_\_

Range: \_\_\_\_\_

X-Intercept: \_\_\_\_\_

Y-Intercept: \_\_\_\_\_

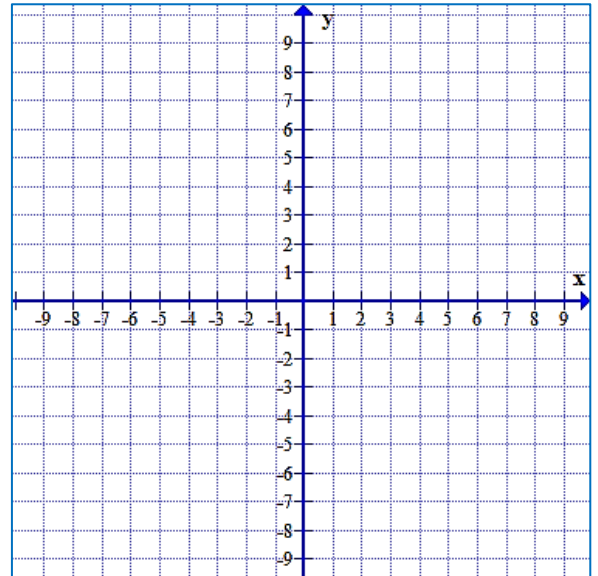
Increasing: \_\_\_\_\_

Decreasing: \_\_\_\_\_

Constant: \_\_\_\_\_

As  $x \rightarrow -\infty, f(x) \rightarrow$  \_\_\_\_\_.

As  $x \rightarrow \infty, f(x) \rightarrow$  \_\_\_\_\_.



7) Graph  $f(x) = 3x - 6$  and identify the characteristics.

Domain: \_\_\_\_\_

Range: \_\_\_\_\_

X-Intercept: \_\_\_\_\_

Y-Intercept: \_\_\_\_\_

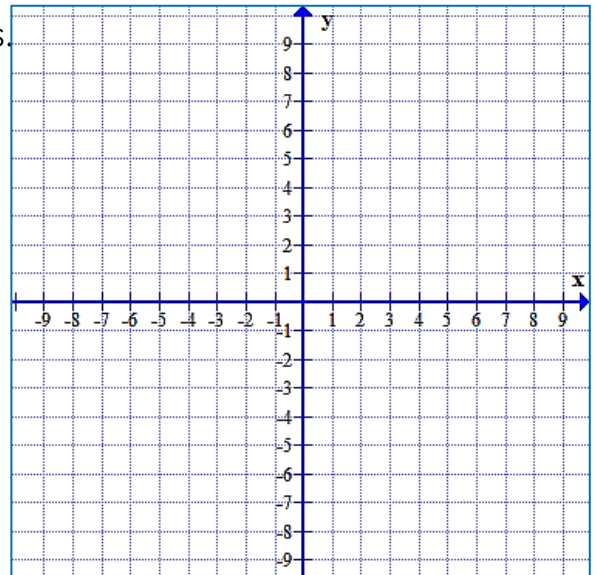
Increasing: \_\_\_\_\_

Decreasing: \_\_\_\_\_

Constant: \_\_\_\_\_

As  $x \rightarrow -\infty, f(x) \rightarrow$  \_\_\_\_\_.

As  $x \rightarrow \infty, f(x) \rightarrow$  \_\_\_\_\_.



8) Graph  $f(x) = -x + 2$  and identify the characteristics.

Domain: \_\_\_\_\_

Range: \_\_\_\_\_

X-Intercept: \_\_\_\_\_

Y-Intercept: \_\_\_\_\_

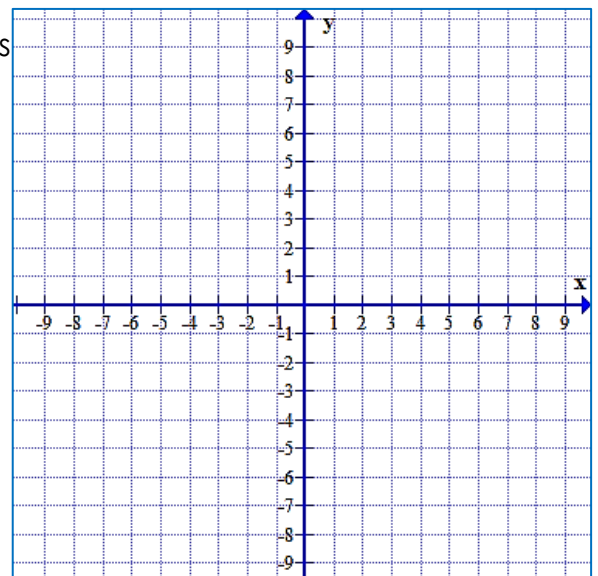
Increasing: \_\_\_\_\_

Decreasing: \_\_\_\_\_

Constant: \_\_\_\_\_

As  $x \rightarrow -\infty, f(x) \rightarrow$  \_\_\_\_\_.

As  $x \rightarrow \infty, f(x) \rightarrow$  \_\_\_\_\_.



9) Graph  $y = -\frac{3}{4}x$  and identify the characteristics.

Domain: \_\_\_\_\_

Range: \_\_\_\_\_

X-Intercept: \_\_\_\_\_

Y-Intercept: \_\_\_\_\_

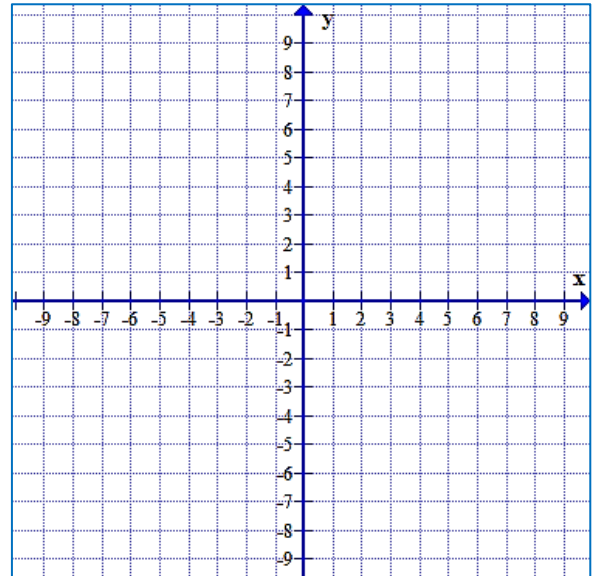
Increasing: \_\_\_\_\_

Decreasing: \_\_\_\_\_

Constant: \_\_\_\_\_

As  $x \rightarrow -\infty, f(x) \rightarrow$  \_\_\_\_\_.

As  $x \rightarrow \infty, f(x) \rightarrow$  \_\_\_\_\_.



10) Graph  $f(x) = -\frac{1}{2}x + 4$  and identify the characteristics.

Domain: \_\_\_\_\_

Range: \_\_\_\_\_

X-Intercept: \_\_\_\_\_

Y-Intercept: \_\_\_\_\_

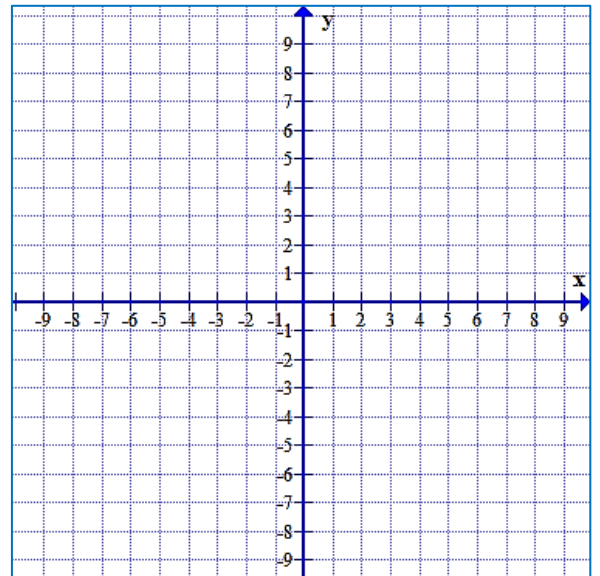
Increasing: \_\_\_\_\_

Decreasing: \_\_\_\_\_

Constant: \_\_\_\_\_

As  $x \rightarrow -\infty, f(x) \rightarrow$  \_\_\_\_\_.

As  $x \rightarrow \infty, f(x) \rightarrow$  \_\_\_\_\_.



8) Graph  $f(x) = \frac{3}{2}x - 5$  and identify the characteristics.

Domain: \_\_\_\_\_

Range: \_\_\_\_\_

X-Intercept: \_\_\_\_\_

Y-Intercept: \_\_\_\_\_

Increasing: \_\_\_\_\_

Decreasing: \_\_\_\_\_

Constant: \_\_\_\_\_

As  $x \rightarrow -\infty, f(x) \rightarrow$  \_\_\_\_\_.

As  $x \rightarrow \infty, f(x) \rightarrow$  \_\_\_\_\_.

