

- Domain:
- $x$ -value;
  - input of the function
  - left to right
- Range:
- $y$ -value;
  - output of the function
  - Bottom to top

End Behavior:  
 What is the graph doing at the end

As  $x \xrightarrow{\text{right}} +\infty, y \Rightarrow$  \_\_\_\_\_  
 $x \xrightarrow{\text{left}} -\infty, y \Rightarrow$  \_\_\_\_\_  
 $+\infty$  up  
 $-\infty$  down

### Characteristics of Functions

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#### Domain and Range

- ⊙ Discrete Graphs: you just list the domain and range.
- ⊙ Continuous Graphs: you use inequalities or Brackets/ Parenthesis.  
 $<, >, (, )$ : are used when there is an open dot or the number is NOT included on the graph.  
 $\leq, \geq, [, ]$ : are used when there is a closed dot or when the number is included on the graph.

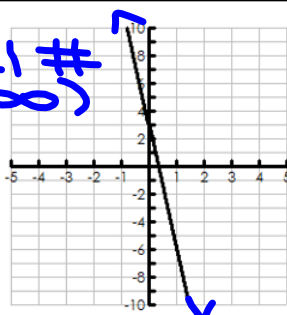
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#### On Your Own:

1. Domain:

Range:

All real #  
 $(-\infty, \infty)$   
 $\mathbb{R}$



$\mathbb{R}$

$\mathbb{R}$

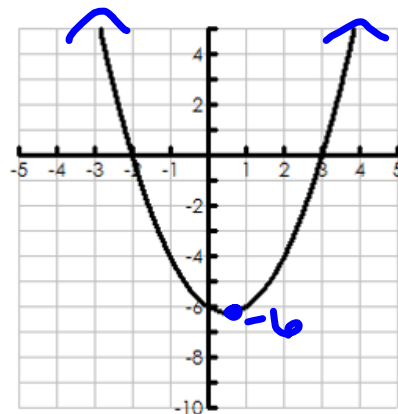
2. Domain:

$$\mathbb{R}$$

Range:

$$y \geq -6$$

$$[-6, \infty)$$



3. Domain:

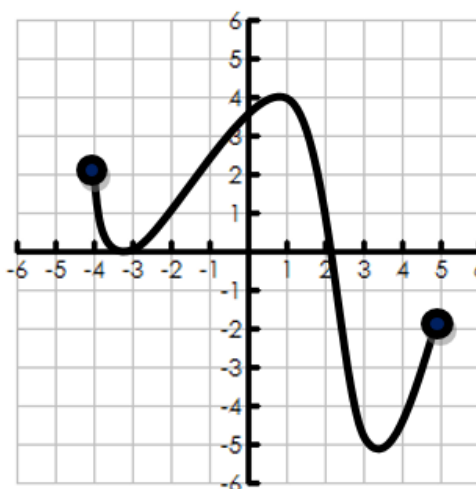
$$-4 \leq x \leq 5$$

$$[-4, 5]$$

Range:

$$[-5, 4]$$

$$-5 \leq y \leq 4$$



**Intercepts**

- ⊙ x-intercept: the point at which the line intersects the x-axis at  $(x,0)$ .
- ⊙ y-intercept: the point at which the line intersects the y-axis at  $(0,y)$ .
- ⊙ Zeros are the same thing as the x-intercepts

**On Your Own:**

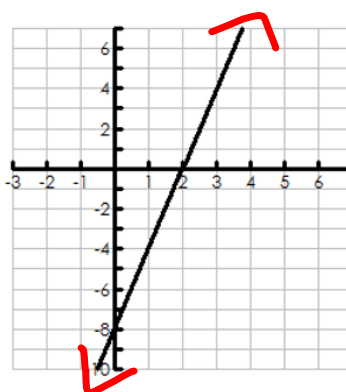
1. Domain:  ~~$\mathbb{R}$~~   
 Range:  ~~$\mathbb{R}$~~   
 x-int:  $(2, 0)$   
 y-int:  $(0, -8)$

End Behavior:

As  $x \rightarrow \infty$ ,  $y \rightarrow +\infty$

As  $x \rightarrow -\infty$ ,  $y \rightarrow -\infty$

Is the graph increasing or decreasing?

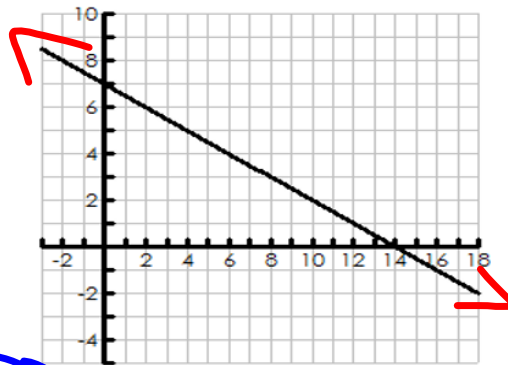


2. Domain:  $\mathbb{R}$   
 Range:  $\mathbb{R}$   
 x-int:  $(14, 0)$   
 y-int:  $(0, 7)$

End Behavior:

As  $x \rightarrow \infty$ ,  $y \rightarrow -\infty$   
 As  $x \rightarrow -\infty$ ,  $y \rightarrow +\infty$

Is the graph increasing or decreasing?



3. Domain:  $\mathbb{R}$   
 Range:  $\mathbb{R}$   
 x-int:  $(-13, 0)$   
 y-int:  $(0, 11)$

End Behavior:

As  $x \rightarrow \infty$ ,  $y \rightarrow +\infty$   
 As  $x \rightarrow -\infty$ ,  $y \rightarrow -\infty$

Is the graph increasing or decreasing?

