

# Algebra I

## Notes Section 3.7

### Graph Linear Functions

#### Big Ideas

1. How to replace  $y$  in functions with  $f(x)$ .
2. How to graph linear functions.
3. How to read function notation.

#### VOCABULARY

Function Notation: \_\_\_\_\_

**EXAMPLE 1** What is the value of the function  $f(x) = 3x - 15$  when  $x = 3$ .

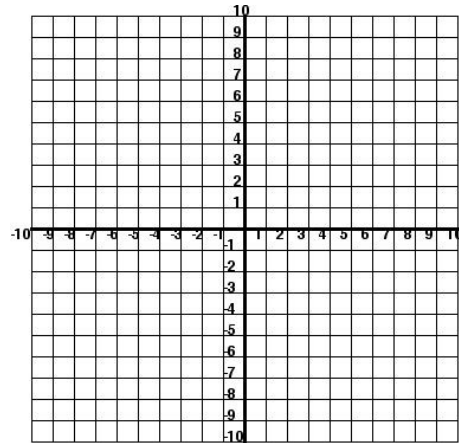
**EXAMPLE 2** For the function  $f(x) = 2x - 10$ , find the value of  $x$  so that  $f(x) = 6$ .

**EXAMPLE 3** The gray wolf population in central Idaho was monitored over several years for a project aimed at boosting the number of wolves. The number of wolves can be modeled by the function  $f(x)=37x+7$  where  $x$  is the number of years since 1995. **Graph the function and identify its domain and range.**

$x$	$f(x)$

**D:** \_\_\_\_\_

**R:** \_\_\_\_\_

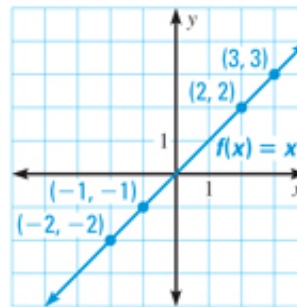


**Parent Function for Linear Functions**

The most basic linear function in the family of all linear functions, called the **parent linear function**, is:

$$f(x) = x$$

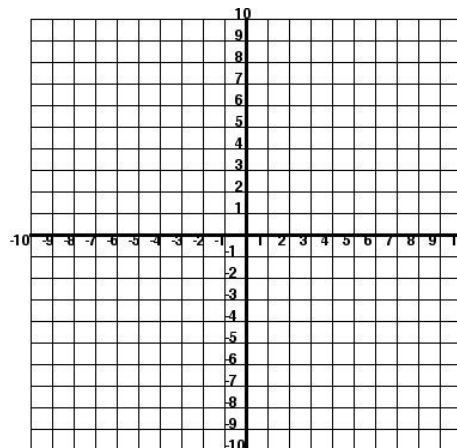
The graph of the parent linear function is shown.



**Example 4** Graph the function. Compare the graph with  $f(x)=x$ .

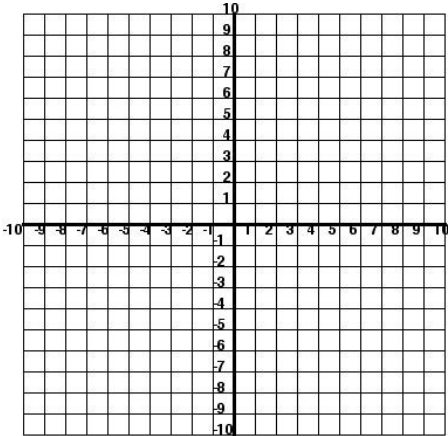
a)  $g(x)=x + 3$

$x$	$y$



b)  $h(x)=2x$

x	y



**Example 5** A cable company charges new customers \$40 for installation and \$60 per month for its service. The cost to the customer is given by the function  $f(x)=60x+40$  where  $x$  is the number of months of service. To attract new customers, the cable company reduces the installation fee to \$5. A function for the cost with the reduced installation fee is  $g(x)=60x+5$ . Graph BOTH functions. How is the graph of  $g$  related to the graph of  $f$ ?

$f(x)=60x+40$

$g(x)=60x+5$

x	f(x)

x	g(x)

