Name _____ Date _____

LESSON 3.7

Study Guide

For use with the lesson "Graph Linear Functions"

GOAL **Use function notation.**

Vocabulary

You have seen linear functions written in the form $y = mx + b$. By naming a function f, you can write it using **function notation:** $f(x) = mx + b$.

A **family of functions** is a group of functions with similar characteristics.

The most basic linear function in the family of all linear functions is called the **parent linear function** and has the following form: $f(x) = x$.

EXAMPLE 1 Standardized Test Practice

What is the value of the function $f(x) = -2x - 7$ when $x = -2$?

(A) -11 (B) -3 (C) 3 (D) 11

Solution

$f(x) = -2x - 7$	Write original function.
$f(-2) = -2(-2) - 7$	Substitute -2 for x.
$= -3$	Simplify.

The correct answer is B.

Exercises for Example 1

Evaluate the function for the given value of x.

1. $f(x) = 0.3x - 1.2; 7$

2. $g(x) = -\frac{2}{5}x + \frac{1}{10}; 4$

EXAMPLE 2 Find an x-value

For the function $f(x) = -3x + 2$, find the value of x so that $f(x) = -13$.

Solution

$f(x) = -3x + 2$	Write original function.
$-13 = -3x + 2$	Substitute -13 for $f(x)$.
$5 = x$	Solve for x.

When $x = 5, f(x) = -13$.

Name _____ Date _____

LESSON 3.7

Study Guide *continued*

For use with the lesson "Graph Linear Functions"

Exercises for Example 2

Find the value of *x* so that the function has the given value.

3. $g(x) = -\frac{1}{2}x - 3; 4$

4. $h(x) = 5x - 3; -13$

EXAMPLE 3 Compare graphs with the graph of $f(x) = x$

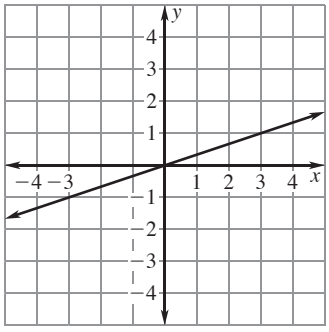
Graph the function. Compare the graph with the graph of $f(x)$.

a. $m(x) = \frac{1}{3}x$

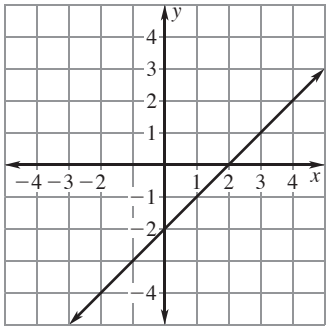
b. $n(x) = x - 2$

Solution

a. Because the slope of the graph of m is less than the slope of the graph of f, the graph of m rises slower from left to right. The y-intercept for both graphs is 0, so both lines pass through the origin.



b. Because the graphs of n and f have the same slope, $m = 1$, the lines are parallel. Also, the y-intercept of the graph of n is 2 less than the y-intercept of the graph of f.



Exercise for Example 3

5. Graph $g(x) = 4x$. Compare the graph with the graph of $f(x) = x$.