Name _____ Date _____

LESSON 4.2

Study Guide

For use with the lesson "Use Linear Equations in Slope-Intercept Form"

GOAL **Write an equation of a line using points on the line.**

EXAMPLE 1 Write an equation given the slope and a point

Write an equation of the line that passes through the point (2, 5) and has a slope of 3.

Solution

STEP 1 **Identify** the slope. The slope is 3.

STEP 2 **Find** the y-intercept. Substitute the slope and the coordinates of the given point into $y = mx + b$. Solve for b.

$y = mx + b$	Write slope-intercept form.
$5 = 3(2) + b$	Substitute 3 for m, 2 for x, and 5 for y.
$-1 = b$	Solve for b.

STEP 3 **Write** an equation of the line.

$y = mx + b$	Write slope-intercept form.
$y = 3x - 1$	Substitute 3 for m, and -1 for b.

EXAMPLE 2 Write an equation given two points

Write an equation of the line that passes through (3, 9) and (−2, −1).

Solution

STEP 1 **Calculate** the slope.

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-1 - 9}{-2 - 3} = \frac{-10}{-5} = 2$$

STEP 2 **Find** the y-intercept. Use the slope and the point (3, 9).

$y = mx + b$	Write slope-intercept form.
$9 = 2(3) + b$	Substitute 2 for m, 3 for x, and 9 for y.
$3 = b$	Solve for b.

STEP 3 **Write** an equation of the line.

$y = mx + b$	Write slope-intercept form.
$y = 2x + 3$	Substitute 2 for m and 3 for b.

LESSON 4.2

Study Guide *continued*

For use with the lesson "Use Linear Equations in Slope-Intercept Form"

Exercises for Examples 1 and 2

Write an equation of the line that passes through the given point and has the given slope.

1. $(7, 2)$; $m = 4$

2. $(9, 15)$; $m = -\frac{1}{3}$

Write an equation of the line that passes through the two given points.

3. $(5, 8)$, $(13, 12)$

4. $(-6, -7)$, $(-3, 5)$

EXAMPLE 3 ## Write a linear function

Write an equation of the linear function with the values $f(2) = 3$ and $f(-3) = 8$.

Solution

STEP 1 **Calculate** the slope. Write $f(2) = 3$ as $(2, 3)$ and $f(-3) = 8$ as $(-3, 8)$.

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{8 - 3}{-3 - 2} = \frac{5}{-5} = -1$$

STEP 2 **Find** the y-intercept. Use the slope and the point $(2, 3)$.

$y = mx + b$	Write slope-intercept form.
$3 = -1(2) + b$	Substitute -1 for m, 2 for x, and 3 for y.
$5 = b$	Solve for b.

STEP 3 **Write** an equation for the function. Use $f(x) = mx + b$.

$f(x) = -x + 5$	Substitute -1 for m and 5 for b.

Exercises for Example 3

Write an equation for a linear function f that has the given values.

5. $f(2) = -4$ and $f(-4) = -7$

6. $f(-5) = 17$ and $f(3) = 9$