5.1 Write Linear Equations in Slope-Intercept Form

$\boxed{Y = MX + B}$

Goal • Write equations of lines.

Your Notes

> Use the slope-intercept form $(y = mx + b)$ to write an equation of a line if slope and y-intercept are given.

Example 1 *Use slope and y-intercept to write an equation*

Write an equation of the line with a slope of −4 and a y-intercept of 6.

Solution

$y = mx + b$ Write slope-intercept form.

$y = \underline{-4}\, x + \underline{6}$ Substitute -4 for m and $\underline{6}$ for b.

✓ **Checkpoint** Write an equation of the line with the given slope and y-intercept.

1. Slope is 8; y-intercept is −5.	2. Slope is $\frac{2}{3}$; y-intercept is −2.
$y = 8x - 5$	$y = \frac{2}{3}x - 2$
3. Slope is −3; y-intercept is 7.	4. Slope is $-\frac{5}{2}$; y-intercept is 9.
$y = -3x + 7$	$y = \frac{-5}{2}x + 9$

3 METHODS TO GRAPH
① TABLE
② INTERCEPTS
③ SLOPE-INTERCEPT

2 WAYS TO FIND SLOPE
① $m = \dfrac{RISE}{RUN}$
② $m = \dfrac{\Delta Y}{\Delta X}$

3 FORMS TO WRITE LINEAR EQUATIONS
① $Y = mx + b$ S/I
② $y - y_1 = m(x - x_1)$ P/S
③ $Ax + By = C$ STANDARD

DEFINITION OF SLOPE: describe the 2 methods to find slope. Give the formula and when you this method.

	Formula Used	When do you use
Method 1	$m = \dfrac{Rise}{Run}$	When given a graph
Method 2	$m = \dfrac{\Delta y}{\Delta x} = \dfrac{y_2 - y_1}{x_2 - x_1}$	Given 2 points

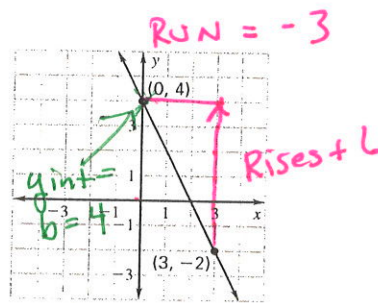### Example 2 Write an equation of a line given two points

Write an equation of the line shown.

Solution

Step 1 Calculate the slope.

> You can write an equation of a line if you know the y-intercept and any other point on the line.

$m = \dfrac{Rise}{Run}\ \dfrac{6}{-3}$

$M = -2$

RUN = -3

(0, 4)

y int = b = 4

Rises + 6

(3, -2)

Step 2 Write an equation of the line. The line crosses the y-axis at ___4___. So, the y-intercept is __(0,4)__

$y = mx + b$ Write slope-intercept form.

$y = \underline{-2}\,x + \underline{4}$ Substitute __-2__ for m and __4__ for b.

✔ **Checkpoint** Complete the following exercise.

5. Write an equation of the line shown.

$M = \dfrac{Rise}{Run} = \dfrac{3}{5}$

$Y = \dfrac{3}{5}X - 6$

+5

(5, -3)

+3

(0, -6)

$Y int = b = -6$