# 4.5 Find Slope Given an Equation

## Key Terms and Concepts

The equation of a line is most commonly written in **slope-intercept form**:  $y = \mathbf{m}x + \mathbf{b}$ . In this form,  $\mathbf{m}$  (the coefficient of x) represents the **slope** of the line and  $\mathbf{b}$  is the y-intercept. The y-intercept is the value of y at the point where the line intersects the y-axis.

### Transforming an equation into slope-intercept form

If the equation is not already in slope-intercept form, you will need to transform the equation by solving for y in terms of x.

Examples: To transform the equations y+2x=4 and 3y=2x-9,

If two distinct lines have the **same slope**, they are **parallel**. So, to determine whether two lines are parallel, write each equation in *slope-intercept form* to determine whether the slopes are the same for both equations.

Model Problem 1: transforming an equation

What is the slope of the line whose equation is 2y-3x=x+2?

#### Solution:

(A) 
$$2y-3x = x + 2$$

$$+3x$$

$$\frac{2y}{2} = \frac{4x+2}{2}$$

$$y = 2x+1$$

(B) Slope is 2

#### Explanation of steps:

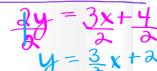
- (A) If the equation is not already in slope-intercept form, transform it by solving for y in terms of x. [Add 3x to both sides, then divide each by 2.]
- (B) For an equation in slope-intercept form, the slope is the coefficient of x [the slope is 2].

# REGENTS QUESTIONS

# Multiple Choice

- 1. The line represented by the equation 2y 3x = 4 has a slope of

(2)2

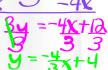


- 2. Which equation represents a line that is parallel to the line whose equation is 2x 3y = 3
  - $y = \frac{2}{3}x 4$

- (3)  $y = \frac{3}{2}x 4$
- (2)  $y = -\frac{2}{3}x + 4$
- (4)  $y = -\frac{3}{2}x + 4$



- 3. What is the slope of the line represented by the equation 4x + 3y = 12?

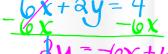


- 4. Which equation represents a line that is parallel to the line whose equation is y = -3x
  - (1) y = -3x + 4
- (3)  $y = \frac{1}{3}x + 5$

- (2)  $y = -\frac{1}{3}x 7$
- (4) y = 3x 2
- y=mx+6
- 5. What is the slope of a line represented by the equation  $2\mathbf{v} = \mathbf{x}$ 
  - (2) -



- 6. Which equation represents a line that is parallel to the line whose equation is y = -3x?
  - $(1) \frac{1}{3}x + y = 4$
- (3) 6x + 2y = 4
- (2)  $-\frac{1}{3}x + y = 4$
- (4) -6x + 2y = 4



- 7. What is the slope of the line represented by the equation 4x + 3y = 7?
  - (1)  $\frac{7}{4}$  $(2) \frac{7}{3}$





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