Course Number

Instructor

Date

## Section 1.3 Linear Equations in Two Variables

**Objective:** In this lesson you learned how to find and use the slopes of lines to write and graph linear equations in two variables.

| **Important Vocabulary** | Define each term or concept. |
|---|---|
| **Slope** | |
| **Parallel** | |
| **Perpendicular** | |

### I. Using Slope (Pages 22–23)

***What you should learn***
How to use slope to graph linear equations in two variables

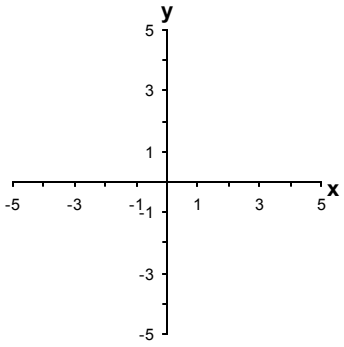
The equation $y = mx + b$ is called a **linear equation in two variables** because . . .

A line whose slope is positive _____ from left to right.

A line whose slope is negative _____ from left to right.

The **slope-intercept form** of the equation of a line is _____, where $m$ is the _____ and the $y$-intercept is (_____, _____).

To graph the line $y = mx + b$ on the coordinate plane, . . .




**Example:** Explain how to graph the linear equation $y = -2/3x - 4$. Then sketch its graph.

The equation of a **horizontal line** is _____. The slope of a horizontal line is _____. To graph a horizontal line, . . .

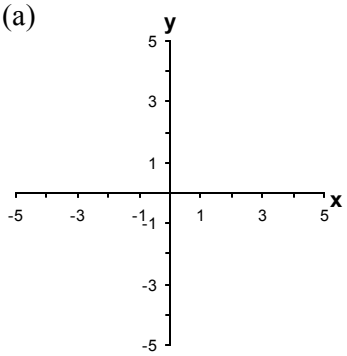
The $y$-coordinate of every point on the graph of a horizontal line is _____.

The equation of a **vertical line** is _____. The slope of a vertical line is _____. To graph a vertical line, . . .

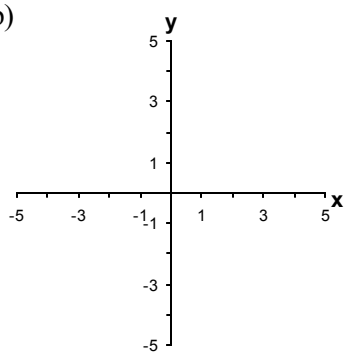
The $x$-coordinate of every point on the graph of a vertical line is _____.

**Example:** Sketch and label the graph of (a) $y = -1$ and (b) $x = 3$.

(a)




(b)




In real-life problems, the slope of a line can be interpreted as either a(n) _____ or a(n) _____. If the $x$-axis and $y$-axis have the same unit of measure, then the slope has no units and is a _____. If the $x$-axis and $y$-axis have different units of measure, then the slope is a _____ _____.

## II. Finding the Slope of a Line (Pages 24–25)

***What you should learn***
How to find slopes of lines

The formula for the **slope** of a line passing through the points $(x_1, y_1)$ and $(x_2, y_2)$ is $m =$ _____ .

To find the slope of the line through the points $(-2, 5)$ and $(4, -3)$, . . .

## III. Writing Linear Equations in Two Variables (Page 26)

***What you should learn***
How to write linear equations in two variables

The **point-slope form** of the equation of a line is

_____.

The **two-point form** of the equation of a line is

_____ .

The **general form** of the equation of a line is

_____.

All equations of lines can be written in general form.

Which form of the equation of a line is most convenient when given:

(a) the slope $m$ and the $y$-intercept $(0, b)$?

(b) the slope $m$ and a point $(x_1, y_1)$ on the graph of the line?

(c) two points $(x_1, y_1)$ and $(x_2, y_2)$ that are on the graph of the line?

For the conditions in (a), (b), and (c) above, is it possible to use only the slope-intercept form to find an equation? Explain.

Is it possible to use only the point-slope form to find an equation? Explain.

**Example:** Find an equation of the line that passes through the points (1, 5) and (– 3, 7) using (a) the slope-intercept form and (b) the point-slope form.

**IV. Parallel and Perpendicular Lines** (Page 27)

***What you should learn***
How to use slope to identify parallel and perpendicular lines

Two lines are _____ if they do not intersect.

Two lines are_____ if they intersect at right angles.

The relationship between the slopes of two lines that are parallel is . . .

The relationship between the slopes of two lines that are perpendicular is . . .

A line that is parallel to a line whose slope is 2 has slope _____.

A line that is perpendicular to a line whose slope is 2 has slope _____.

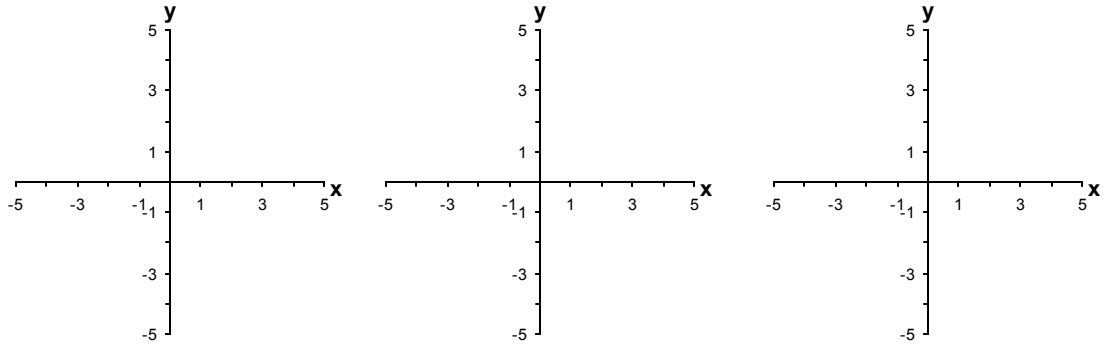
**V. Applications** (Pages 28 - 29)

***What you should learn***
How to use linear equations in two variables to model and solve real-life problems

Describe a real-life situation in which slope is a ratio.

Describe a real-life situation in which slope is a rate of change.

**Additional notes**




**Homework Assignment**

Page(s)

Exercises