

32. parallel to $y = 9x$, through $(0, -5)$
 33. perpendicular to $y = 8x - 1$, through $(4, 10)$

6-6 Objectives

- ▼ To write an equation for a trend line and use it to make predictions (p. 318)
- ▼ To write the equation for a line of best fit and use it to make predictions (p. 319)

You can find an equation to model the relationship between two sets of data in a scatter plot by sketching a trend line and using two points on the line to write an equation.

The **line of best fit** of a scatter plot is the most accurate trend line for the data. You can find the equation of a line of best fit using a graphing calculator. The **correlation coefficient** tells how well the equation of the line of best fit models the data.



34. **Graphing Calculator** The table shows the average consumption of poultry in the United States in pounds per person from 1970 to 2000.

Years	Pounds
1970	33.8
1975	32.9
1980	40.8
1985	45.5
1990	56.3
1995	62.9
2000	68.4

- a. Find the equation of a trend line or use a graphing calculator to find the equation of the line of best fit.
- b. Use your equation to **predict** how much poultry the average person will eat in 2010.

SOURCE: U.S. Department of Agriculture. Go to www.PHSchool.com for a data update.
 Web Code: aeg-2041

6-7 Objective

- ▼ To translate the graph of an absolute value equation (p. 325)

The graph of an **absolute value equation** is a V-shaped graph that points upward or downward.

A **translation** shifts a graph either vertically, horizontally, or both. It results in a graph of the same shape and size in a different position.

Graph each equation by translating $y = |x|$.

35. $y = |x - 2|$

36. $y = |x| - 3$

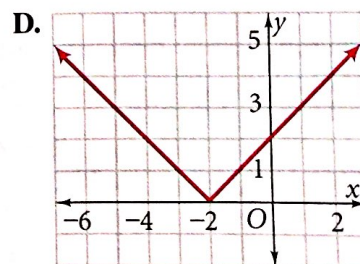
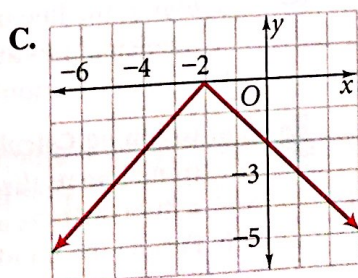
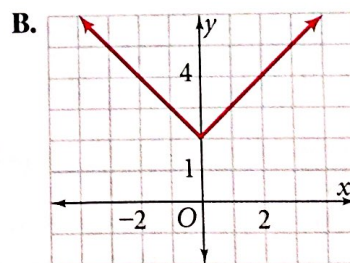
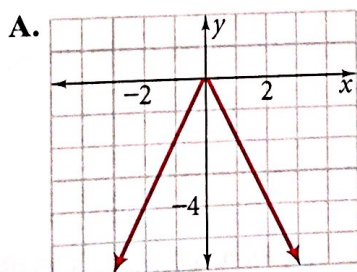
Match each equation with one of the graphs below.

37. $y = |x| + 2$

38. $y = |x + 2|$

39. $y = -|x + 2|$

40. $y = -2|x|$



6-2, 6-3, and 6-4 Objectives

- ▼ To write linear equations in slope-intercept form (p. 291)
- ▼ To graph linear equations (p. 293)
- ▼ To graph equations using intercepts (p. 298)
- ▼ To write equations in standard form (p. 300)
- ▼ To graph and write linear equations using point-slope form (p. 304)
- ▼ To write a linear equation using data (p. 306)

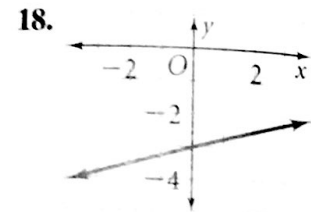
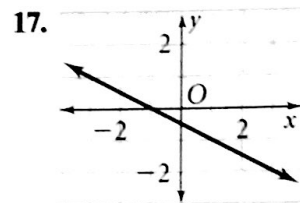
The graph of a **linear equation** is a line. The **x-intercept** of a line is the x-coordinate of the point where the line crosses the x-axis, and the **y-intercept** is the y-coordinate of the point where the line crosses the y-axis. Following are the forms of linear equations.

- **slope-intercept form:** $y = mx + b$ where m is the slope and b is the y-intercept
- **standard form:** $Ax + By = C$, where A , B , and C are real numbers, and A and B are not both zero
- **point-slope form:** $y - y_1 = m(x - x_1)$, which passes through the point (x_1, y_1) with slope m

Write an equation of a line with the given slope and y-intercept. Then graph the equation.

14. $m = 0, b = -3$ 15. $m = -7, b = \frac{1}{2}$ 16. $m = \frac{2}{5}, b = 0$

Write the slope-intercept form of the equation for each line.



Find the x- and y-intercepts. Then graph each equation.

19. $5x + 2y = 10$ 20. $6.5x - 4y = 52$ 21. $x + 3y = -1$

Use point-slope form to write an equation of a line that passes through the point $(1, -2)$ with slope m .

22. $m = 2$ 23. $m = \frac{3}{4}$ 24. $m = -3$ 25. $m = 0$

Use the point-slope form to write an equation of a line through the given points.

26. $(4, 3), (-2, 1)$ 27. $(5, -4), (0, 2)$ 28. $(-1, 0), (-3, -1)$

29. **Earnings** A job at a retail store pays \$75 each week plus 25% commission on total weekly sales.
- a. Write an equation for the total weekly pay p for total weekly sales s .
 - b. Use p as the vertical axis and s as the horizontal axis. Graph your equation.
 - c. What is the total weekly pay if total weekly sales are \$800?
 - d. What is the p intercept? What does it mean in this situation?

6-5 Objectives

- ▼ To determine whether lines are parallel (p. 311)
- ▼ To determine whether lines are perpendicular (p. 312)

Parallel lines are lines in the same plane that never intersect. Nonvertical lines are parallel if they have the same slope. Two lines are **perpendicular lines** if they intersect to form right angles. For perpendicular lines that are not horizontal and vertical, the product of their slopes is -1 .

Write an equation for each of the following conditions.

30. parallel to $y = 5x - 2$, through $(2, -1)$
31. perpendicular to $y = -3x + 7$, through $(3, 5)$

Chapter Review

Vocabulary

absolute value equation (p. 325)
 correlation coefficient (p. 319)
 line of best fit (p. 319)
 linear equation (p. 291)
 negative reciprocal (p. 312)
 parallel lines (p. 311)

perpendicular lines (p. 312)
 point-slope form (p. 304)
 rate of change (p. 282)
 slope (p. 284)
 slope-intercept form (p. 292)

standard form of a
 linear equation (p. 298)
 translation (p. 325)
 x-intercept (p. 298)
 y-intercept (p. 291)



Reading Math Understanding Vocabulary

Choose the vocabulary term that correctly completes the sentence.

- Two lines are ? if the product of their slopes is -1 .
- Two lines in the same plane that never intersect are ?.
- A(n) ? shifts a graph horizontally, vertically, or both.
- The ratio of the vertical change to the horizontal change is called the ?.
- The y-coordinate of the point at which the graph of a line crosses the vertical axis is called the ?.

Take It to the NET

Online vocabulary quiz
 at www.PHSchool.com
 Web Code: aej-0651

Skills and Concepts

6-1 Objectives

- To find rates of change from tables and graphs (p. 282)
- To find slope (p. 284)

Rate of change allows you to look at how two quantities change relative to each other.

$$\text{rate of change} = \frac{\text{change in the dependent variable}}{\text{change in the independent variable}}$$

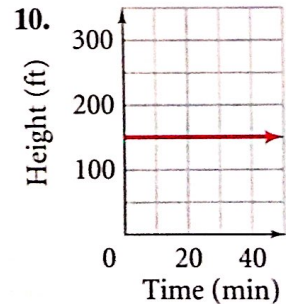
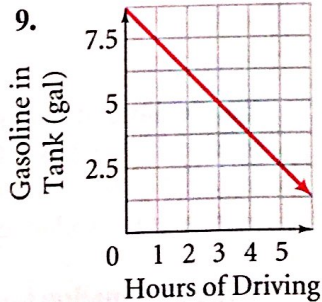
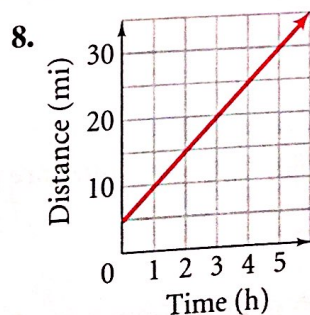
Slope is the ratio of the vertical change to the horizontal change.

$$\text{slope} = \frac{\text{vertical change}}{\text{horizontal change}} = \frac{\text{rise}}{\text{run}}$$

Find the rate of change for each situation.

- A kitten grows from 5 oz at birth to 3 lb 5 oz at 6 months. (*Hint: 1 lb = 16 oz*)
- A plant measures 0.5 in. at the end of Week 1 and 14 in. at the end of Week 5.

Find each rate of change. Explain what *rate of change* means in each situation.



Find the slope of the line that passes through each pair of points.

- $(3, -2)$ and $(-5, -4)$
- $(4.5, -1)$ and $(4.5, 2.6)$
- $(2, 5)$ and $(-5, -2)$