11.4 Apply the Pythagorean Theorem and Its Converse *pp. 737–742*

EXAMPLE

Find the unknown length for the triangle shown.

$$a^2 + b^2 = c^2 \qquad \text{Pythagorean theorem}$$
$$6^2 + b^2 = 11^2 \qquad \text{Substitute 6 for } a \text{ and 11 for } c.$$
$$36 + b^2 = 121 \qquad \text{Simplify.}$$
$$b^2 = 85 \qquad \text{Subtract 36 from each side.}$$
$$b = \sqrt{85} \qquad \text{Take positive square root of each side.}$$

EXERCISES

EXAMPLES 1 and 4
on pp. 737, 739
for Exs. 23–29
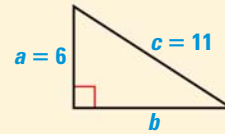
Let a and b represent the lengths of the legs of a right triangle, and let c represent the length of the hypotenuse. Find the unknown length.

23. $a = 7, b = 13$ **24.** $a = 10, c = 21$ **25.** $a = 8, c = 11$

26. $a = 9, b = 17$ **27.** $b = 4, c = 15$ **28.** $b = 6, c = 6.5$

29. REFLECTING POOL The Reflecting Pool in front of the Lincoln Memorial in Washington, D.C., is rectangular with a length of 2029 feet and a width of 167 feet. To the nearest foot, what is the length of a diagonal of the Reflecting Pool?

11.5 Apply the Distance and Midpoint Formulas *pp. 744–750*

EXAMPLE

Find the distance between $(-3, 8)$ and $(5, -12)$.

Let $(x_1, y_1) = (-3, 8)$ and $(x_2, y_2) = (5, -12)$.

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} \qquad \text{Distance formula}$$
$$= \sqrt{(5 - (-3))^2 + (-12 - 8)^2} \qquad \text{Substitute.}$$
$$= \sqrt{464} = 4\sqrt{29} \qquad \text{Simplify.}$$

EXERCISES

EXAMPLES 1, 3, and 4
on pp. 744, 746
for Exs. 30–36

Find the distance between the two points.

30. $(-1, -3), (9, -13)$ **31.** $(-8, -4), (0, 2)$ **32.** $(7, 1), (4, -0.25)$

Find the midpoint of the line segment with the given endpoints.

33. $(-2, -4), (9, -4)$ **34.** $(-8, 0), (-8, 2)$ **35.** $(6, 1), (4, -5)$

36. ISLANDS On a coordinate grid, an island is located at $(1, 6)$. Another island is located at $(4, 9)$. What is the distance between the islands if the distance between consecutive grid lines represents 2 miles?