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# Reteaching 1-1

**Rational Numbers**

A fraction is in simplest form when the *greatest common factor* (GCF) of the numerator and denominator is 1.

*Example 1:* Write $\frac{24}{36}$ in simplest form.

Use prime factorization and circle the common factors.

$$24 = 2 \cdot 2 \cdot 2 \cdot 3$$
$$36 = 2 \cdot 2 \cdot 3 \cdot 3$$

So, $\frac{24}{36} = \frac{2}{3}$.

To write a fraction as a decimal:

① Divide numerator by denominator.

② Divide until the remainder is 0 or until the remainder repeats.

③ Use a bar to show digits repeating.

*Example 2:* Write $\frac{5}{6}$ as a decimal.

$$\begin{array}{r} 0.833 \\ 6\overline{)5.000} \\ \underline{-48} \\ 20 \\ \underline{-18} \\ 20 \\ \underline{-18} \\ 2 \end{array} \leftarrow \text{Remainder repeats.}$$

So $\frac{5}{6} = 0.833\ldots$, or $0.8\overline{33}$.

To write a decimal as a fraction:

*Example 3:* Write 0.375 as a fraction.

① Write as a fraction with the denominator 1. $0.375 = \frac{0.375}{1}$

② Since there are 3 digits to the right of the decimal point, multiply the numerator and the denominator by 1,000. $= \frac{375}{1000}$

③ Divide the numerator and denominator by the GCF. $= \frac{375 \div 125}{1000 \div 125}$

④ Simplify. $= \frac{3}{8}$

So $0.375 = \frac{3}{8}$.

**Write each fraction in simplest form.**

**1.** $\frac{16}{64}$ ________ **2.** $-\frac{30}{48}$ ________ **3.** $\frac{42}{63}$ ________

**4.** $-\frac{32}{40}$ ________ **5.** $-\frac{12}{28}$ ________ **6.** $\frac{18}{27}$ ________

**Write each fraction or mixed number as a decimal rounded to three decimal places.**

**7.** $\frac{7}{9}$ ________ **8.** $-3\frac{2}{7}$ ________ **9.** $\frac{5}{9}$ ________

**10.** $5\frac{3}{7}$ ________ **11.** $\frac{4}{3}$ ________ **12.** $\frac{1}{11}$ ________

**Write each decimal as a mixed number or fraction in simplest form.**

**13.** 0.2 ________ **14.** 0.16 ________ **15.** 0.3 ________

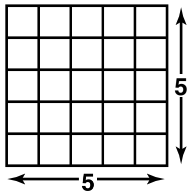
**16.** 2.75 ________ **17.** 4.52 ________ **18.** 0.36 ________

# Reteaching 1-2

## Irrational Numbers and Square Roots

- The *square* of 5 is 25.
  $5 \cdot 5 = 5^2 = 25$
- The *square root* of 25 is 5 because $5^2 = 25$.

$\sqrt{25} = 5$




$1^2 = 1$
$2^2 = 4$
$3^2 = 9$
$4^2 = 16$
$5^2 = 25$
} *perfect squares*

*Example:* You can use a calculator to find square roots.
Find $\sqrt{36}$ and $\sqrt{21}$ to the nearest tenth.

36 [√] = 6      21 [√] ≈ 4.5825757 ≈ 4.6

You can estimate square roots like $\sqrt{52}$ and $\sqrt{61}$.

| | | | | | |
|---|---|---|---|---|---|
| Perfect squares → | 49 | | $\sqrt{49} = 7$ | | $\sqrt{49} = 7$ |
| | 52 | Estimate | $\sqrt{52} \approx 7$ | Estimate | $\sqrt{61} \approx 8$ |
| Perfect squares → | 64 | | $\sqrt{64} = 8$ | | $\sqrt{64} = 8$ |

---

**Find each square root. Estimate to the nearest integer if necessary.**
**Use ≈ to show that a value is estimated.**

**1.** $\sqrt{16}$ ________  **2.** $\sqrt{85}$ ________  **3.** $\sqrt{26}$ ________  **4.** $\sqrt{36}$ ________

**5.** $\sqrt{98}$ ________  **6.** $\sqrt{40}$ ________  **7.** $\sqrt{100}$ ________  **8.** $\sqrt{18}$ ________

**9.** $\sqrt{5}$ ________  **10.** $\sqrt{121}$ ________  **11.** $\sqrt{68}$ ________  **12.** $\sqrt{144}$ ________

**13.** $\sqrt{29}$ ________  **14.** $\sqrt{64}$ ________  **15.** $\sqrt{37}$ ________  **16.** $\sqrt{75}$ ________

**17.** If a whole number is not a perfect square, its square root is an *irrational number.* List the numbers from exercises 1–16 that are irrational.

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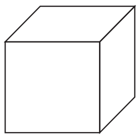
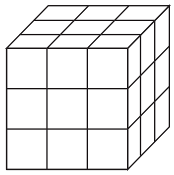
# Reteaching 1-3

## Cube Roots



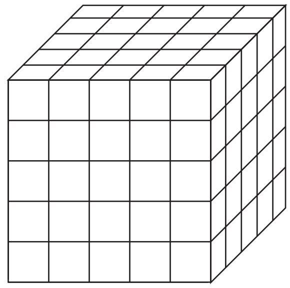
The cube of 1 is 1.

$1 \times 1 \times 1 = 1^3 = 1$



The cube of 3 is 27.

$3 \times 3 \times 3 = 3^3 = 27$



The cube of 5 is 125.

$5 \times 5 \times 5 = 5^3 = 125$

perfect cubes

$1^3 = 1$ $\quad 3^3 = 27$ $\quad 5^3 = 125$

Example: You can solve cube root equations: $x^3 = \frac{27}{216}$

$\sqrt[3]{x^3} = \sqrt[3]{\frac{27}{216}}$ ← **Find the cube root of each side.**

$= \frac{\sqrt[3]{27}}{\sqrt[3]{216}}$ ← **Find the cube root of the numerator and denominator.**

$x = \frac{3}{6} = \frac{1}{2}$ ← **Simplify.**

---

**Find the cube root of each number.**

**1.** 729 ____________

**2.** 125 ____________

**3.** 512 ____________

**4.** $-64$ ____________

**5.** $\frac{1}{216}$ ____________

**6.** $\frac{125}{1000}$ ____________

**Solve each equation by finding the value of *x*.**

**7.** $x^3 = 27$ ____________

**8.** $x^3 = 1{,}728$ ____________

**9.** $x^3 = \frac{343}{729}$ ____________

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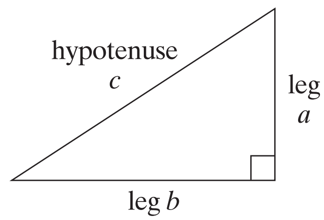
# Reteaching 1-4

## The Pythagorean Theorem

*The Pythagorean Theorem*

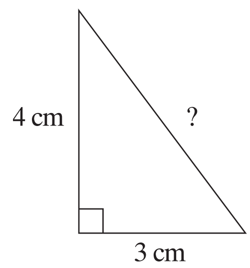
The sum of the squares of the lengths of the *legs* of a right triangle is equal to the square of the length of the *hypotenuse*.




$$a^2 + b^2 = c^2$$

*Example 1:* Find the length of the hypotenuse.

$$a^2 + b^2 = c^2$$
$$3^2 + 4^2 = c^2$$
$$9 + 16 = c^2$$
$$25 = c^2$$
$$\sqrt{25} = c^2$$
$$5 = c$$




The length $c$ of the hypotenuse is 5 cm.

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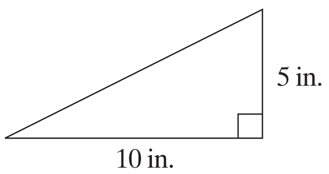
**Find the length of the hypotenuse of each triangle. If necessary, round to the nearest tenth.**

**1.**

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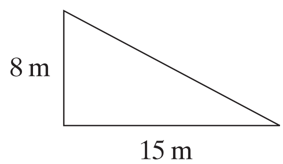
**2.**

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**The lengths of the legs of a right triangle are given. Find the length of the hypotenuse.**

**3.** legs: 6 ft and 8 ft
hypotenuse: ______________________

**4.** legs: 12 cm and 5 cm
hypotenuse: ______________________

**5.** legs: 24 mm and 7 mm
hypotenuse: ______________________

**6.** legs: 15 yd and 20 yd
hypotenuse: ______________________

**7.** legs: 0.024 m and 0.007 m
hypotenuse: ______________________

**8.** legs: 3,000 mi and 4,000 mi
hypotenuse: ______________________

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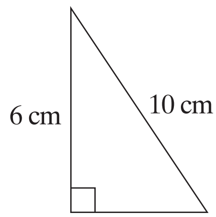
# Reteaching 1-5

## Using the Pythagorean Theorem

You can use the Pythagorean Theorem to find the length of a leg in a right triangle.

*Example:* Find the length of the unknown side.

$$a^2 + b^2 = c^2$$
$$6^2 + b^2 = 10^2$$
$$36 + b^2 = 100$$
$$b^2 = 100 - 36$$
$$b^2 = 64$$
$$b = \sqrt{64}$$
$$b = 8$$




The length $b$ of the unknown leg is 8 cm.

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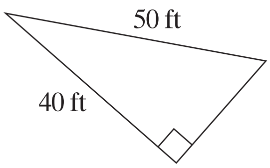
**Find the missing leg length. If necessary, round to the nearest tenth.**

**1.**

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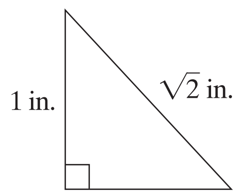
**2.**

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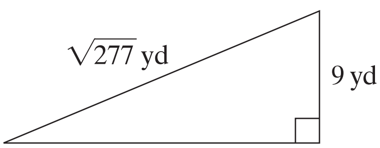
**3.**

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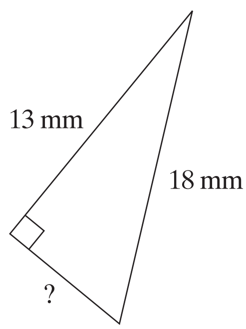
**4.**

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**5.** Marcus leans a 12-ft ladder against a wall to clean a window. If the base of the ladder is 3 feet away from the wall, how high up the wall does the ladder reach? If necessary, round to the nearest tenth.

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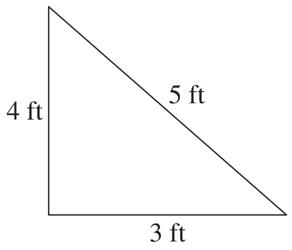
# Reteaching 1-6

## Converse of the Pythagorean Theorem

You can use the Pythagorean Theorem to determine whether a triangle is a right triangle.




$a^2 + b^2 \stackrel{?}{=} c^2$ ← Use the Pythagorean Theorem.

$3^2 + 4^2 \stackrel{?}{=} 5^2$ ← Substitute 3 for *a*, 4 for *b*, and 5 for *c*.

$9 + 16 \stackrel{?}{=} 25$ ← Simplify.

$25 = 25$

The equation is true so the triangle is a right triangle.

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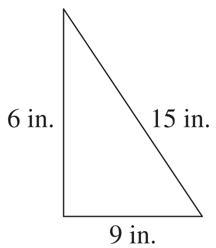
**Determine whether the given lengths can be side lengths of a right triangle.**

**1.**

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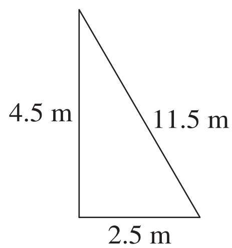
**2.**

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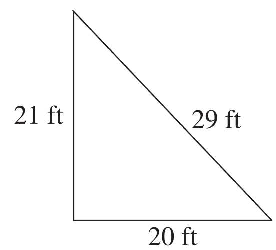
**3.**

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**4.** 8 mm, 14 mm, 26 mm

______________________

**5.** 12 cm, 5 cm, 13 cm

______________________

**6.** 9 yd, 40 yd, 25 yd

______________________

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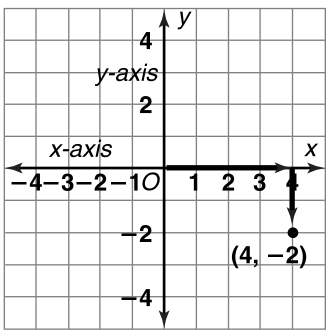
# Reteaching 1-7

## Distance in the Coordinate Plane

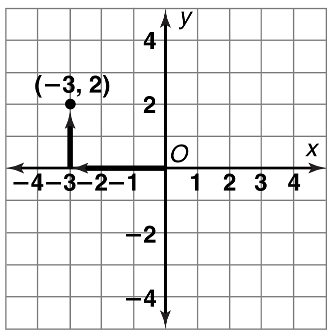
You can graph a point on a *coordinate plane.* Use an *ordered pair* $(x, y)$ to record the coordinates. The first number in the pair is the *x-coordinate.* The second number is the *y-coordinate.*

To graph a point, start at the origin, *O.* Move horizontally according to the value of *x*. Move vertically according to the value of *y*.

*Example 1:* $(4, -2)$
Start at *O,* move right 4, then down 2.




*Example 2:* $(-3, 2)$
Start at *O,* move left 3, then up 2.

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**Graph each ordered pair on the coordinate plane. Label each point with its letter. Then connect the points in order from *A* to *S.* Connect point *S* with point *A* to complete a picture.**

$A(7, 7)$

$B(6, 3)$

$C(6, 2)$

$D(5, 1)$

$E(7, -7)$

$F(4, -6)$

$G(1, -2)$

$H(0, -4)$

$I(-1, -2)$

$J(-4, -6)$

$K(-7, -7)$

$L(-5, 1)$

$M(-6, 2)$

$N(-6, 3)$

$P(-7, 7)$

$Q(-1, 3)$

$R(0, 4)$

$S(1, 3)$