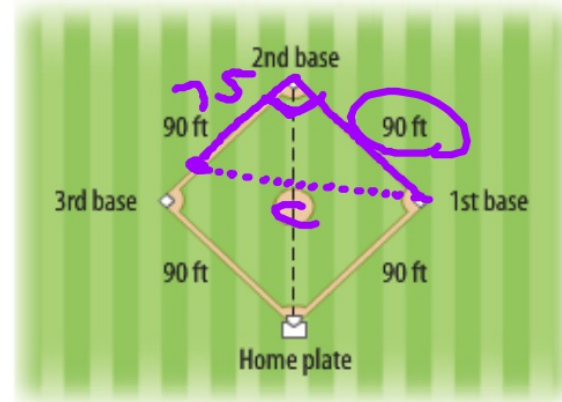


Example 2

5. BASEBALL A baseball diamond is a square. The distance between consecutive bases is 90 feet.

- a. How far does a catcher have to throw the ball from home plate to second base? **about 127 ft**
- b. How far does a third baseman throw the ball to the first baseman from a point in the baseline 15 feet from third to second base? **about 117 ft**
- c. A base runner going from first to second base is 100 feet from home plate. How far is the runner from second base? **about 46 ft**



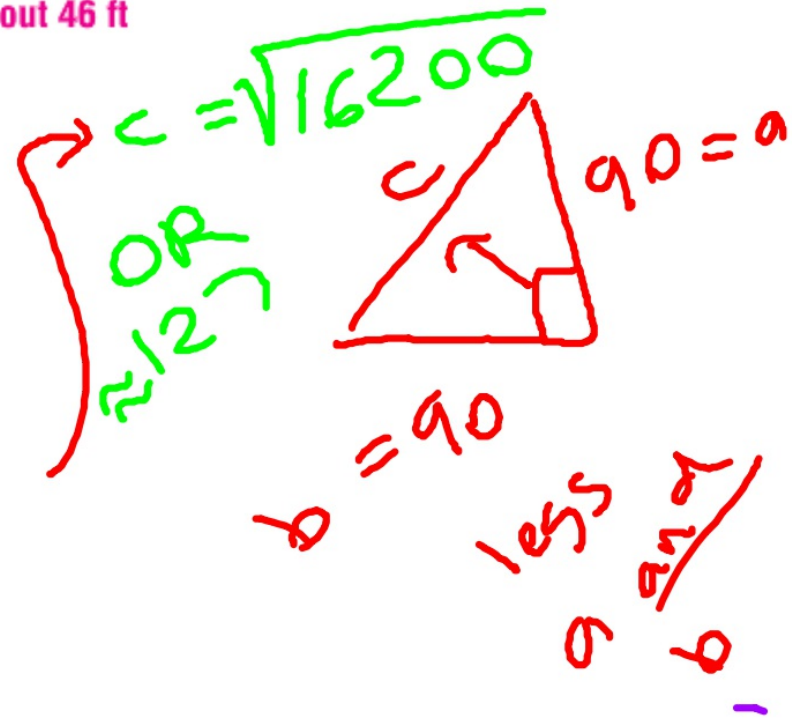
$$90^2 + 75^2 = c^2$$

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

$$90^2 + 90^2 = c^2$$

$$8100 + 8100 = c^2$$

$$\sqrt{16200} = c$$



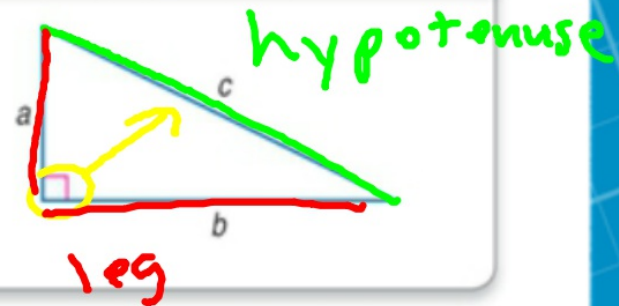
 **Key Concept** The Pythagorean Theorem

Words If a triangle is a right triangle, then the square of the length of the hypotenuse is equal to the sum of the squares of the lengths of the legs.

Symbols

$$\underline{c^2} = \underline{a^2} + \underline{b^2}$$

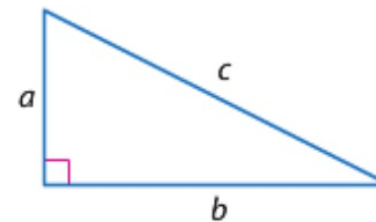
leg



KeyConcept The Pythagorean Theorem

Words If a triangle is a right triangle, then the square of the length of the hypotenuse is equal to the sum of the squares of the lengths of the legs. 🖐

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

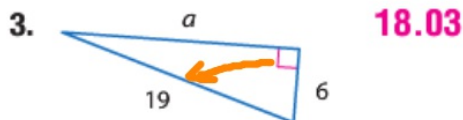
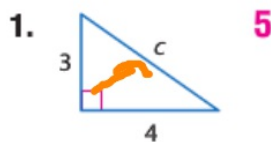


Check Your Understanding

🟢 = Step-by-Step Solutions begin on page R13.



Example 1 Find each missing length. If necessary, round to the nearest hundredth.



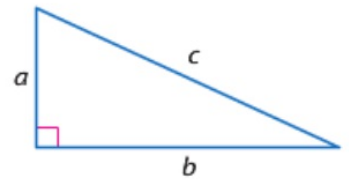
① $a^2 + b^2 = c^2$
 $3^2 + 4^2 = c^2$
 $9 + 16 = c^2$
 $25 = c^2$

③ $a^2 + b^2 = c^2$
 $a^2 + 6^2 = 19^2$
 $a^2 + 36 = 361$
 $a^2 = 325$
 $a = \sqrt{325}$

Verify!!!

KeyConcept The Pythagorean Theorem

Words If a triangle is a right triangle, then the square of the length of the hypotenuse is equal to the sum of the squares of the lengths of the legs. ☞



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

Q: Is it a Rt. Δ?

(6) $16 = c$
 $8 = a$
 $12 = b$
 $8^2 + 12^2 = 16^2$
 $64 + 144 = 256$
 $49 + 578 = 625$
 $7 + 24^2 = 25^2$

(8) $c = 25$
 $a = 24$
 $b = 7$

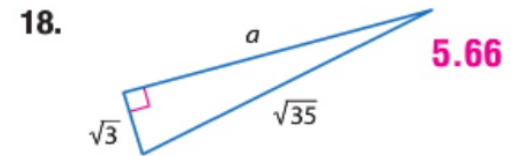
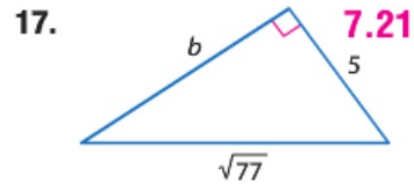
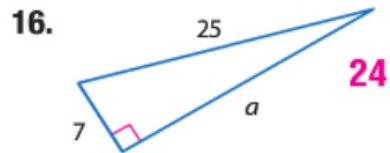
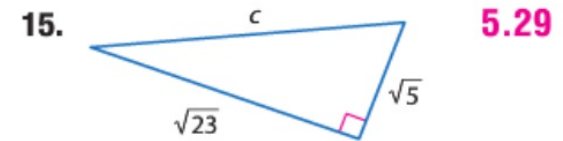
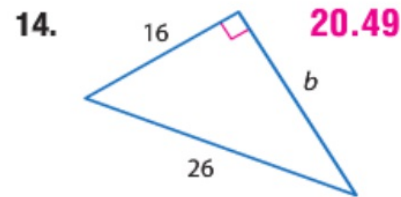
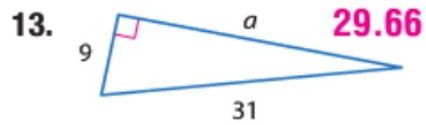
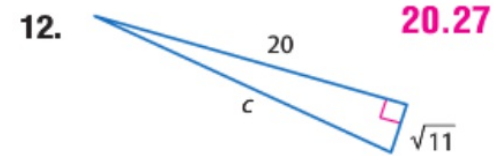
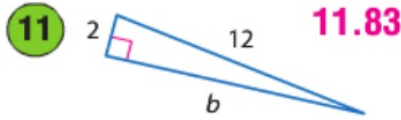
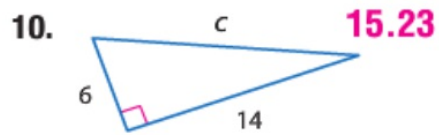
2809
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 284
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Example 3 Determine whether each set of measures can be the lengths of the sides of a right triangle.

- 6. 8, 12, 16 **no**
- 7. 28, 45, 53 **yes**
- 8. 7, 24, 25 **yes**
- 9. 15, 25, 45 **no**




Example 1 Find each missing length. If necessary, round to the nearest hundredth.



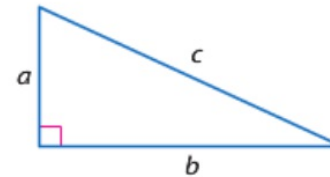
$$2^2 + b^2 = 12^2$$



 **KeyConcept** The Pythagorean Theorem

Words If a triangle is a right triangle, then the square of the length of the hypotenuse is equal to the sum of the squares of the lengths of the legs. 

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



Example 2 **19 TELEVISION** Larry is buying an entertainment stand for his television. The diagonal of his television is 42 inches. The space for the television measures 30 inches by 36 inches. Will Larry's television fit? Explain. **Yes; sample answer: The diagonal of the space in the TV stand is 46.9 inches, so Larry's TV will fit.**

Example 3 Determine whether each set of measures can be the lengths of the sides of a right triangle. Then determine whether they form a Pythagorean triple.

20. 9, 40, 41 **yes; yes**

21. 3, $2\sqrt{10}$, $\sqrt{41}$

22. 4, $\sqrt{26}$, 12 **no; no**

23. $\sqrt{5}$, 7, 14

24. 8, 31.5, 32.5 **yes; no**

25. $\sqrt{65}$, $6\sqrt{2}$, $\sqrt{97}$

26. 18, 24, 30 **yes; yes**

27. 36, 77, 85

28. 17, 33, 98 **no; no**