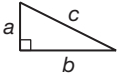


Name _____ Date _____

The Pythagorean Theorem (Pages 398–401)

The longest side of a right triangle is the **hypotenuse**. The sides that form the right angle are the **legs**.

Pythagorean Theorem	In a right triangle, the square of the length of the hypotenuse is equal to the sum of the squares of the lengths of the legs. $c^2 = a^2 + b^2$	
Converse of Pythagorean Theorem	If the sides of a triangle have lengths a , b , and c units such that $c^2 = a^2 + b^2$, then the triangle is a right triangle.	

EXAMPLE

Is a triangle that has sides of 3, 5, and 7 a right triangle?
Is 7^2 equal to $3^2 + 5^2$? No, $49 \neq 9 + 25$, so the sides do not fit the converse of the Pythagorean Theorem. It is not a right triangle.

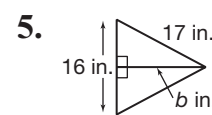
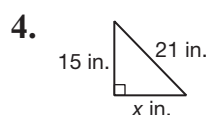
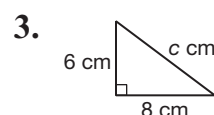
Try These Together

Round to the nearest tenth.

- Find the length of the missing side of the right triangle. a , 7 m; c , 11 m
HINT: Use $c^2 = a^2 + b^2$. Solve for b .
- Find the length of the missing side of the right triangle. b , 24 cm; c , 37 cm
HINT: Use the Pythagorean Theorem.

PRACTICE

Find the missing length in each right triangle. Round to the nearest tenth.



6. a , 19 yd; b , 16 yd

7. b , 67 mm; c , 69 mm

8. a , 6.2 m; b , 8.6 m

Determine whether each triangle with sides of given lengths is a right triangle.

9. 9 in., 12 in., 15 in.

10. 16 ft, 29 ft, 18 ft

11. 9 m, 7 m, 13 m



12. **Standardized Test Practice** The cities of Coldwater, Wayne, and Clinton form a right triangle on the map. The distance from Wayne to Coldwater is 50 miles. The distance from Coldwater to Clinton is 60 miles. Coldwater is due north of Wayne, and Clinton is due east of Coldwater. To the nearest mile, how far is it if you drive directly from Wayne to Clinton?

A 55 mi

B 67 mi

C 78 mi

D 110 mi

Answers: 1. 8.5 m 2. 28.2 cm 3. 10 4. 14.7 in. 5. 15 6. 24.8 7. 16.5 8. 10.6 9. yes 10. no 11. no 12. C