

PRACTICE Geometry Unit 3 Test

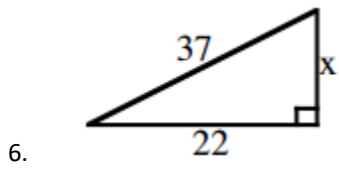
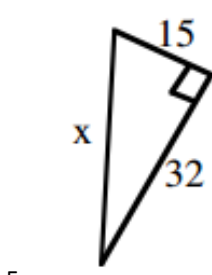
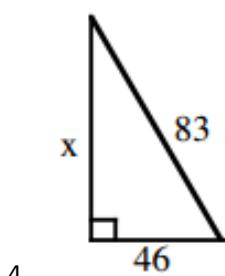
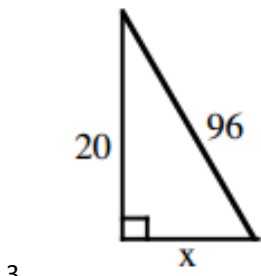
RIGHT TRIANGLE TRIGONOMETRY Standard(s): MCC9-12.G.SRT.6; MCC9-12.G.SRT.7; MCC9-12.G.SRT.8

Pythagorean Theorem

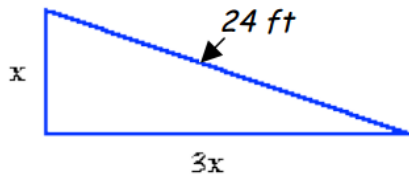
The Pythagorean Theorem states that in a right triangle the sum of the squares of the legs of the triangle is equal to the square of the hypotenuse. The formula is often written as $a^2 + b^2 = c^2$, where “c” is the length of the hypotenuse and “a” and “b” are the lengths of the legs.

1. Could 8, 12, and 13 represent the lengths of sides of a right triangle? Justify your answer.
2. Could 9, 12, and 15 represent the lengths of sides of a right triangle? Justify your answer.

Find x for the following right triangles



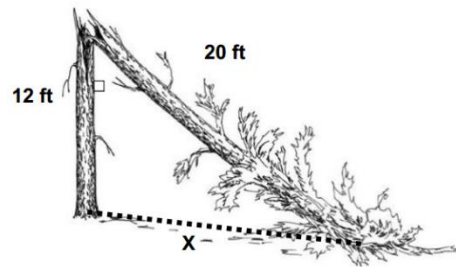
7. Find the length of sides of the following right triangle.



8. The bottom of a 13-foot straight ladder is set into the ground 5 feet away from a wall. When the top of the ladder is leaned against the wall, what is the distance above the ground it will reach?
9. What is the perimeter and area of a right triangle if the hypotenuse is 15 centimeters and one of the legs is 9

centimeters?

10. Lightning struck a tree, causing it to break and crash to the ground. The tree broke off 12 feet above the ground and the broken part was 20 feet long. If the broken tree formed a right triangle, how far away from the stump was the top of the tree?



11. If the sum of the sides of a right triangle is 49 inches and the hypotenuse is 41 inches, find the two sides.

Special Right Triangles

“Special Right Triangles” is the name given two triangles frequently used— one is a right isosceles triangle (angle measures 45°–45°–90°) and the other is a right triangle (angle measures 30°–60°–90°).

45°–45°–90°

Hypotenuse = $\sqrt{2} * \text{leg}$

$$\text{leg} = \frac{\text{hypotenuse}}{\sqrt{2}}$$

30°–60°–90°

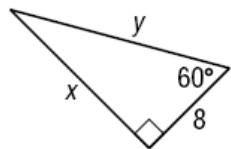
Hypotenuse = $2 * \text{shorter leg}$

Longer leg = $\sqrt{3} * \text{shorter leg}$

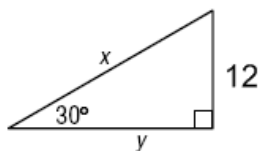
$$\text{short leg} = \frac{\text{hypotenuse}}{2}$$

$$\text{short leg} = \frac{\text{long leg}}{\sqrt{3}}$$

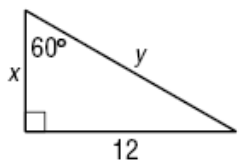
Find the value of x and y in each triangle.



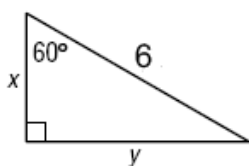
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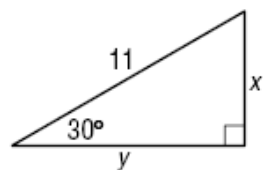
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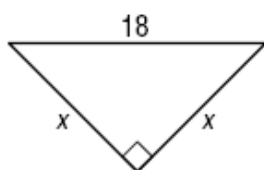
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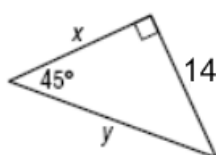
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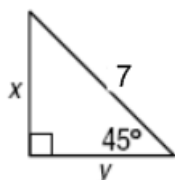
16.



17.



18.



19.

20. The side length of an equilateral triangle is 5 centimeters. Find the length of an altitude of the triangle.

21. The perimeter of a square is 36 inches. Find the length of a diagonal.

22. The diagonal of a square is 26 inches. Find the length of a side.

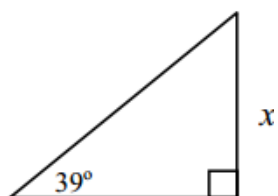
• **Right Triangle Trigonometry**

$$\sin \theta = \frac{Opp}{Hyp} \quad \cos \theta = \frac{Adj}{Hyp} \quad \tan \theta = \frac{Opp}{Adj}$$

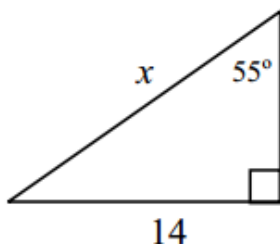
23. In right triangle ABC, $m\angle A = 35^\circ$ and the hypotenuse $AB=15$. Find the length of BC to the nearest tenth.

24. In right triangle ABC, $m\angle B = 41^\circ$ and a leg $BC=20$. Find the length of the hypotenuse AB to the nearest tenth.

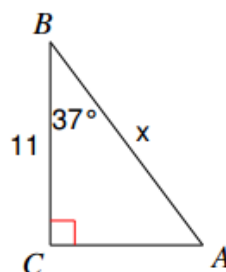
Find x



25.

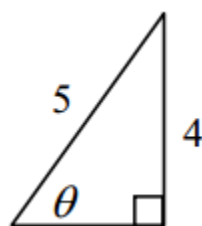


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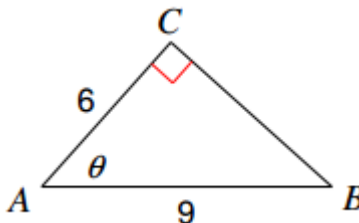


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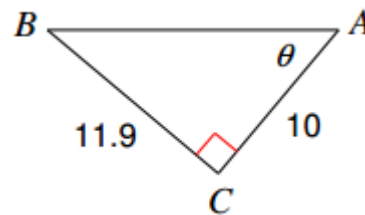
Find θ



28.



29.



30.

• **Applications of Right Triangle Trigonometry**

31. A ten-foot ladder is leaned against the side of a house in such a way that it makes an angle of 65° with the ground. How high up the house does the ladder reach? (Round your answer to the nearest tenth.)

32. A camper is hiking and is standing on top of a 400 foot cliff enjoying the view. He looks down and views a bear at a 37° angle of depression. How far is the bear from the base of the cliff? (Round your answer to the nearest foot, and disregard the height of the camper in your calculations.)

33. The Washington Monument is 555 feet tall. If an observer is standing 300 feet from the base of the monument, find the angle of elevation from the viewpoint of the observer as he sights the top of the monument. (Round your answer to the nearest tenth, and ignore the height of the observer in your calculations.)