

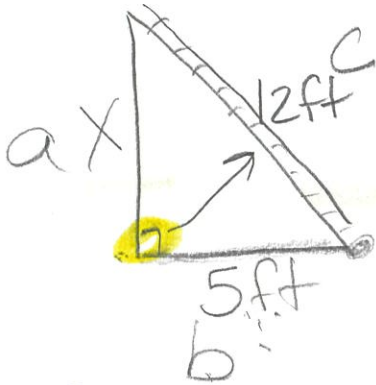
Name: Key

Pythagorean Theorem  
Word Problems

*★ You must draw a diagram ★*

- 1) A ladder 12 feet long is leaning against a building. How high on the building will the ladder reach when the bottom of the ladder is 5 feet from the building? Round to the nearest tenth.

- A) 10.9 ft      C) 8.5 ft  
B) 13 ft      D) 9.2 ft



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

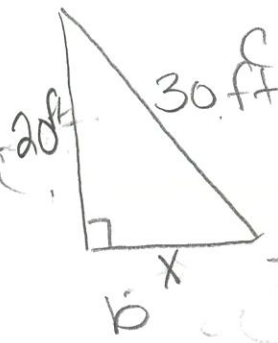
$$a^2 + 5^2 = 12^2$$

$$a^2 + 25 = 144$$

$$\begin{array}{r} -25 \quad -25 \\ \hline a^2 = 119 \\ a = 10.9 \text{ ft} \end{array}$$

- 3) A 30-foot cable holds a telephone pole in place. The cable is attached to the telephone pole 20 feet above the ground. Find the distance along the ground from the base of the pole to the cable. Round to the nearest tenth.

- A) 22.4 ft      C) 10 ft  
B) 36.1 ft      D) 18.6 ft



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

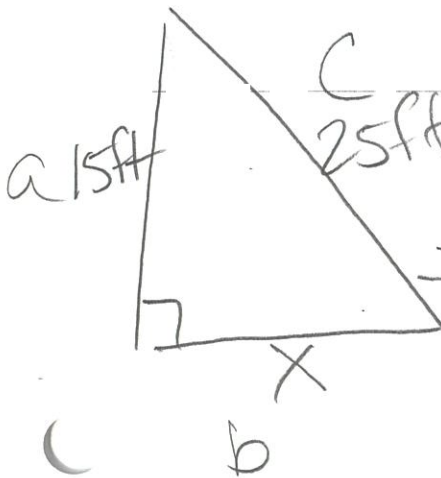
$$20^2 + b^2 = 30^2$$

$$400 + b^2 = 900$$

$$\begin{array}{r} -400 \quad -400 \\ \hline b^2 = 500 \\ b = 22.4 \text{ ft} \end{array}$$

- 2) A 25-foot cable holds a telephone pole in place. The cable is attached to the telephone pole 15 feet above the ground. Find the distance along the ground from the base of the pole to the cable.

- A) 29.1 ft      C) 10 ft  
B) 22 ft      D) 20 ft



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

$$15^2 + b^2 = 25^2$$

$$225 + b^2 = 625$$

$$\begin{array}{r} -225 \quad -225 \\ \hline b^2 = 400 \\ b = 20 \text{ ft} \end{array}$$

- 4) Using the pythagorean theorem,  $a^2 + b^2 = c^2$ , what is the length of the hypotenuse of a right triangle whose legs are 3 and 4?

- A) 144      C) 25  
B) 12      D) 5



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

$$3^2 + 4^2 = c^2$$

$$9 + 16 = c^2$$

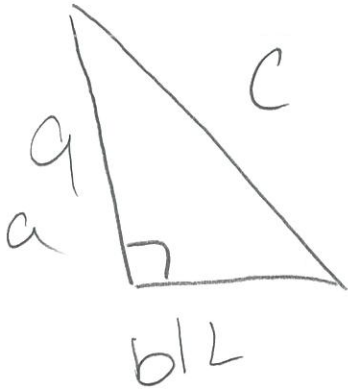
$$\sqrt{25} = \sqrt{c^2}$$

$$c = 5$$

5) Using the pythagorean theorem,  $a^2 + b^2 = c^2$ , what is the length of the hypotenuse of a right triangle whose legs are 9 and 12?

- A) 3  
B) 21

- C) 15  
D) 8



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

$$9^2 + 12^2 = c^2$$

$$81 + 144 = c^2$$

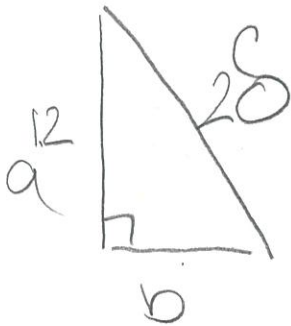
$$\sqrt{225} = \sqrt{c^2}$$

$$c = 15$$

6) What is the measure of one leg of a right triangle if the other leg measures 12 and the hypotenuse measures 20?

- A) 16  
B) 8

- C) 23  
D) 32



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

$$12^2 + b^2 = 20^2$$

$$144 + b^2 = 400$$

$$\begin{array}{r} 144 + b^2 = 400 \\ -144 \quad -144 \\ \hline b^2 = 256 \end{array}$$

$$\sqrt{b^2} = \sqrt{256}$$

$$b = 16$$

7) A ladder 15 feet long is leaning against a building. How high on the building will the ladder reach when the bottom of the ladder is 4 feet from the building? Round to the nearest tenth.

- A) 15.5 ft  
B) 13 ft

- C) 11 ft  
D) 14.5 ft



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

$$a^2 + 4^2 = 15^2$$

$$a^2 + 16 = 225$$

$$\begin{array}{r} a^2 + 16 = 225 \\ -16 \quad -16 \\ \hline a^2 = 209 \end{array}$$

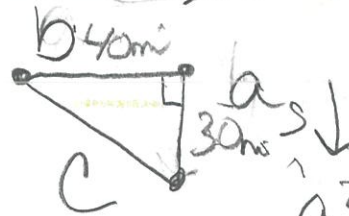
$$\sqrt{a^2} = \sqrt{209}$$

$$a = 14.5$$

8) A car is driven 40 miles east and then 30 miles south. How far is the car from the starting point?

- A) 10 mi  
B) 26.5 mi

- C) 50 mi  
D) 44 mi



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

$$30^2 + 40^2 = c^2$$

$$900 + 1600 = c^2$$

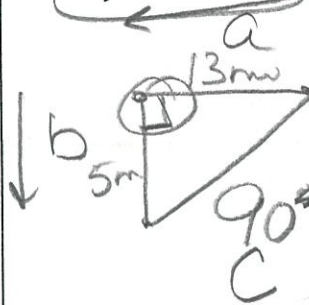
$$\sqrt{2500} = \sqrt{c^2}$$

$$c = 50 \text{ mi}$$

9) A car is driven 13 miles west and then 5 miles south. How far is the car from the starting point? Round to the nearest tenth.

- A) 8 mi  
B) 13.9 mi

- C) 12 mi  
D) 10 mi



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

$$13^2 + 5^2 = c^2$$

$$169 + 25 = c^2$$

$$\sqrt{194} = \sqrt{c^2}$$

$$c = 13.9$$