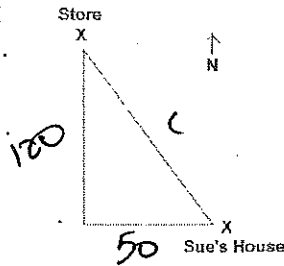


8.G.7 Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in 2 and 3 dimensions.

Sue left her house traveling due west towards the store. After 50 yards she traveled due north 120 yards to the store. When she left the store she cut across the field and traveled along a straight path.



How much shorter was the path Sue took home than the path she took to the store?

- A) 40 yards B) 61 yards
C) 70 yards D) 109 yards

$$50^2 + 120^2 = C^2$$

$$2500 + 14400 = C^2$$

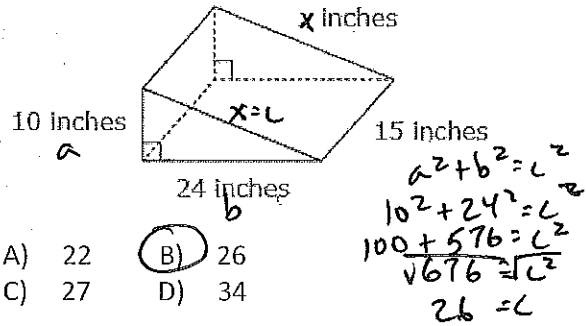
$$\sqrt{16900} = \sqrt{C^2}$$

$$130 = C$$

$$170 - 130 = 40$$

Ashley is making a skateboard ramp in the shape of a triangular prism. The figure shows three dimensions of the ramp. What is the missing dimension in inches, x , of Ashley's skateboard ramp?

Skateboard Ramp



- A) 22 B) 26
C) 27 D) 34

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

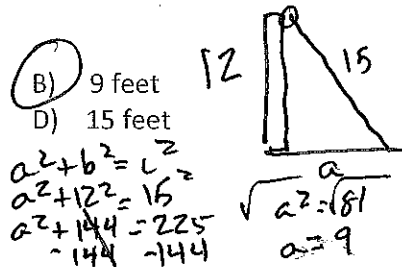
$$10^2 + 24^2 = C^2$$

$$\frac{100 + 576 = C^2}{\sqrt{676} = \sqrt{C^2}}$$

$$26 = C$$

To secure a telephone pole, a steel cable will be attached to a ring on the pole 12 feet above the ground. If the cable is 15 feet long, how far from the base of the pole will the end of the cable be anchored?

- A) 3 feet B) 9 feet
C) 12 feet D) 15 feet



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

$$a^2 + 12^2 = 15^2$$

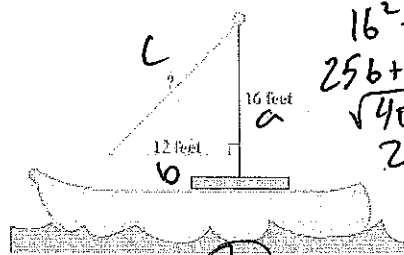
$$a^2 + 144 = 225$$

$$-144 \quad -144$$

$$a^2 = 81$$

$$a = 9$$

What is the measure of the missing side of the sail?



- A) 18 feet B) 20 feet
C) 22 feet D) 24 feet

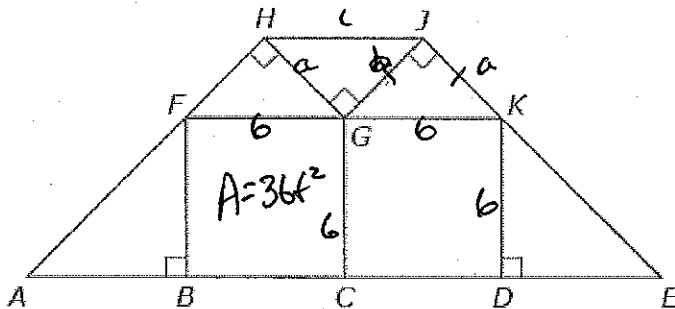
$$16^2 + 12^2 = C^2$$

$$256 + 144 = C^2$$

$$\sqrt{400} = \sqrt{C^2}$$

$$20 = C$$

A large picture window is made from 7 pieces of glass: 2 large squares, 2 large isosceles triangles, and 3 small isosceles triangles. Adjacent figures share sides and vertices, as shown in the diagram of the window. The area of square BCGF is 36 square feet.



Part A: What is the length of segment JK? Explain.

Since $\triangle JKG$ is isosceles, JK and JG are congruent. They will both be represented by the variable x .

$$JK = x = \sqrt{18}$$

Part B: What is the length of segment HJ? Explain.

JG = $\sqrt{18}$ and HJ = $\sqrt{18}$ because it is isosceles.

$$HJ = 6$$

Part C: What is the length of segment KE? Explain.

$\triangle KDE$ is isosceles, so if $KD = 6$, then $DE = 6$.

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

$$6^2 + 6^2 = c^2$$

$$36 + 36 = c^2$$

$$\sqrt{72} = \sqrt{c^2}$$

$$6 = c$$

$$KE = \sqrt{72}$$

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

$$x^2 + x^2 = 6^2$$

$$2x^2 = 36$$

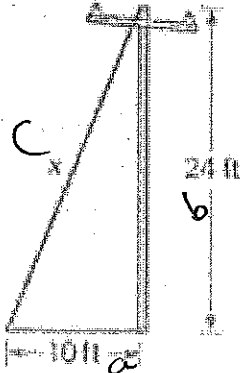
$$\frac{2x^2}{2} = \frac{36}{2}$$

$$x^2 = 18$$

$$x = \sqrt{18}$$

8.G.7 Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in 2 and 3 dimensions.

A telephone pole is secured to the ground by a wire. The distance from the place where the wire is attached to the ground is 10 feet from the base of the pole. What is the length of the wire?



- A. 14 feet
- B. 17 feet
- C. 26 feet**
- D. 34 feet

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

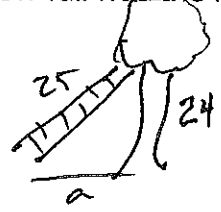
$$10^2 + 24^2 = c^2$$

$$100 + 576 = c^2$$

$$\sqrt{676} = \sqrt{c^2}$$

$$26 = c$$

The Marysville Fire Department was sent to rescue a cat from a tree. The firefighters laid a 25-foot ladder against the tree at a height of 24 feet. How far was the ladder from the tree?



- A. 5 ft
- B. 6 ft
- C. 7 ft**
- D. 8 ft

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

$$a^2 + 24^2 = 25^2$$

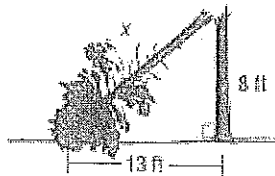
$$a^2 + 576 = 625$$

$$-576 \quad -576$$

$$\sqrt{a^2} = \sqrt{49}$$

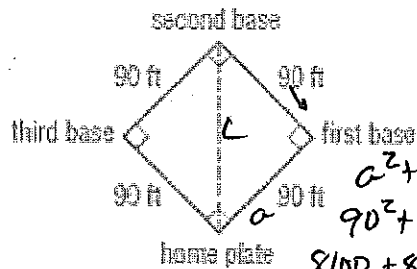
$$a = 7$$

A large pine tree was struck by lightning and fell as shown by the diagram below. Which equation could be used to find the length of the fallen part of the tree?



- A. $8^2 + 13^2 = x$
- B. $\sqrt{8^2 + 13^2} = x$**
- C. $13^2 - 8^2 = x$
- D. $\sqrt{13^2 - 8^2} = x$

Matt is the catcher for his school's baseball team. The catcher must be able to throw from home plate to second base. What is the distance from home plate to second base?



- A. 90 feet
- B. 8,100 feet
- C. 16,200 feet
- D. $\sqrt{16,200}$ feet**

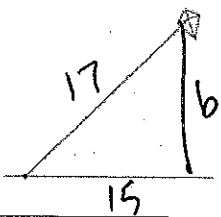
$$a^2 + b^2 = c^2$$

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

$$8100 + 8100 = c^2$$

$$\sqrt{16,200} = \sqrt{c^2}$$

While flying a kite at the beach, you notice that the shadow is 15 yards long. You also know that you have let out 17 yards of string. How high is the kite?



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

$$15^2 + b^2 = 17^2$$

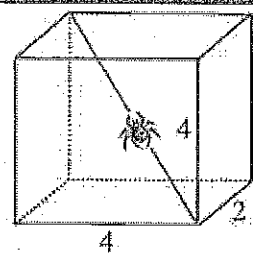
$$225 + b^2 = 289$$

$$-225 \quad -225$$

$$\sqrt{b^2} = \sqrt{64}$$

$$b = 8 \text{ yards}$$

Sam's pet spider, Charlotte, lives in an aquarium in the shape of a rectangular prism shown to the right. She has created a web diagonally across the aquarium. What is the length of the web?



- a. $\sqrt{12}$ units
- b. $\sqrt{20}$ units
- c. 6 units**
- d. 36 units

$$d^2 = l^2 + w^2 + h^2$$

$$d^2 = 4^2 + 4^2 + 2^2$$

$$d^2 = 16 + 4 + 4$$

$$d^2 = 24$$

$$d = \sqrt{24} = 2\sqrt{6}$$