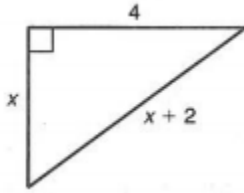
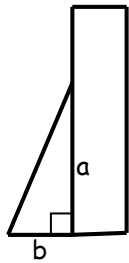


Connecting Pythagorean Theorem to Algebra...

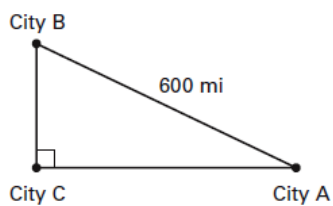
- a) Find the value of x .



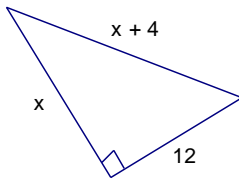
- b) To prevent a ladder from shifting, safety experts recommend that the ratio of $a:b$ be 4:1. How far from the base of the wall should you place the foot of a 10-foot ladder? Round to the nearest inch.



- c) A small commuter airline flies to three cities whose locations form the vertices of a right triangle. The total flight distance (from City A to City B to City C and back to City A) is 1400 miles. It is 600 miles between the two cities that are furthest apart. Find the other two distances between cities.

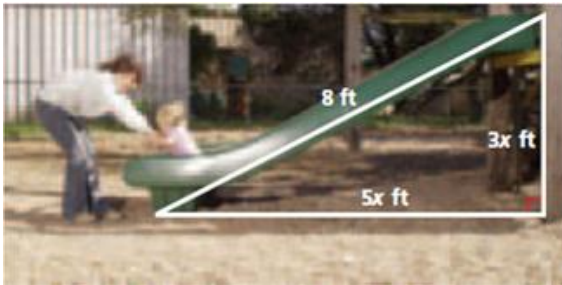


- 1) Find the value of x . Give your answer in simplest radical form.



- 2) Randy is building a rectangular picture frame. He wants the ratio of the length to the width to be 3:1 and the diagonal to be 12 cm. How wide should the frame be? Round to the nearest centimeter.

- 3) The safety rules for a playground state that the height of the slide and the distance from the base of the ladder to the front of the slide must be in the ratio of 3:5. If a slide is 8 feet long, what are the height of the slide and the distance from the base of the ladder to the front of the slide? Round to the nearest inch.

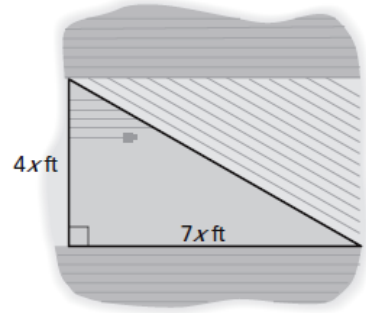


- 4) As part of your exercise routine, you jog around the neighborhood block, which is shaped like a right triangle. Your street, the hypotenuse of the triangle, is 850 feet long. If the total distance around your block is 2000 feet, what are the distances of the other two streets that enclose your block?

- 5) A farmer is planning on cultivating a triangular plot of land as shown in the diagram. The plot has an **area** of 12,600 square feet.

a) Find the value of x .

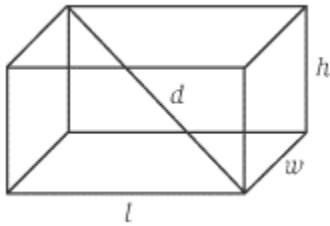
b) Find the perimeter of the plot of land.



c) One acre of land is equivalent to 43,560 square feet. How many acres are in this plot of land? Round to two decimal places.

d) The farmer wants to enclose the land with a fence. A post will be placed every 12 feet around the perimeter. How many posts are needed?

- 6) Find the length of the diagonal of a rectangular prism whose length, width, and height are 5 m, 6 m, and 3 m, respectively.



a) Find the length along the diagonal of the base.

b) Use your answer from part a to solve the right triangle formed by the diagonal of the base, the height of the prism, and the diagonal of the prism.

- 7) A rope is stretched from the top of a 7-foot tent pole to a point on the ground 12 feet from the base of the pole. How long is the rope?

Answer Key:

- 1) 16 2) 3.8 cm 3) 4 ft 1 in. and 6 ft 10 in. 4) 400 ft and 750 ft
 5) 4) a) 30 b) 571.9 ft c) 0.29 d) 48 6) a) $\sqrt{61}$ m b) $\sqrt{70}$ m 7) 13.9 ft