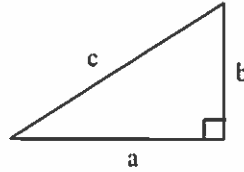


1. Use the Pythagorean theorem to find the missing side.

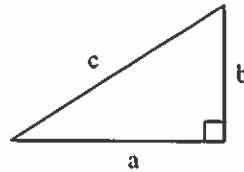
$$c = 8, a = 4, \text{ find } b$$



$$b = \boxed{} \text{ (Simplify your answer. Type a radical expression in lowest terms.)}$$

2. Use the Pythagorean theorem to find the missing side.

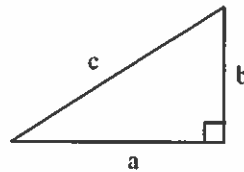
$$c = \sqrt{26}, b = \sqrt{15}, \text{ find } a$$



$$a = \boxed{} \text{ (Simplify your answer. Type a radical expression in lowest terms.)}$$

3. Use the Pythagorean theorem to find the missing side.

$$c = 9, b = 2a; \text{ find } a \text{ and } b$$



$$a = \boxed{} \text{ (Simplify your answer. Type a radical expression in lowest terms.)}$$

$$b = \boxed{} \text{ (Simplify your answer. Type a radical expression in lowest terms.)}$$

4. A brace for a shelf has the shape of a right triangle. Its hypotenuse is 20 inches long and the two legs are equal in length. How long are the legs of the triangle?

The legs of the triangle are both $\boxed{}$ inches long.

(Simplify your answer. Type a radical expression in lowest terms.)

5. A college is creating a new rectangular parking lot. The length is 0.17 mile longer than the width and the area of the parking lot is 0.039 square mile. Find the length and width of the parking lot.

The width of the parking lot is $\boxed{}$ mile. (Type an integer or a decimal.)

The length of the parking lot is $\boxed{}$ mile. (Type an integer or a decimal.)

6. The area of a rectangular wall of a barn is 48 square feet. Its length is 10 feet longer than twice its width. Find the length and width of the wall of the barn.
 width = feet
 length = feet

7. The area of a triangular flag is 72 square centimeters. Its altitude is 2 centimeters longer than twice its base. Find the lengths of the altitude and the base.
 The length of the base is cm.
 The length of the altitude is cm.

8. Greg drove at a constant speed in a rainstorm for 288 miles. He took a break, and the rain stopped. He then drove 220 miles at a speed that was 8 miles per hour faster than his previous speed. If he drove for 13 hours, find the car's speed for each part of the trip.
 The rate of the car in the rain was mph.
 The rate of the car without the rain was mph.

9. The number of inmates N (measured in thousands) in federal and state prisons can be approximated by the equation $N = -2.02x^2 + 77.88x + 743$, where x is the number of years since 1990. In what year was the number of inmates expected to be 1,236,760?
 The number of inmates was expected to be 1,236,760 in the year .

10. Bob drove from home to work at 60 mph. After work the traffic was heavier, and he drove home at 25 mph. His driving time to and from work was 1 hour and 8 minutes. How far does he live from his job?
 Bob lives miles from his job.
 (Simplify your answer.)

11. Sales of SUVs (sport utility vehicles) in the United States (in millions) for the years 1990-1999 can be modeled by the quadratic function shown below.

$$f(x) = 0.016x^2 + 0.124x + 0.787$$

Here $x = 0$ represents 1990, $x = 1$ represents 1991, and so on. Use the model to approximate sales in 1997.

Sales in 1997 were approximately million SUVs.
(Round to the nearest tenth as needed.)

12. Solve for the variable specified. Assume that all other variables are nonzero.

$$A = 9w^2; \text{ for } w$$

Choose the correct answer below.

☐ $w = \pm \frac{\sqrt{A}}{9}$

☐ $w = \pm \frac{\sqrt{A}}{3}$

☐ $w = \pm \sqrt{9A}$

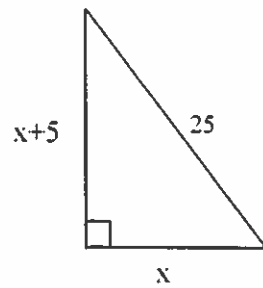
☐ $w = \pm \sqrt{3A}$

13. A security fence encloses a rectangular area on one side of a park in a city. Three sides of fencing are used, since the fourth side of the area is formed by a building. The enclosed area measures 1458 square feet. Exactly 108 feet of fencing is used to fence in three sides of this rectangle. What are the possible dimensions that could have been used to construct this area?

The shorter dimension of the fenced area is feet.

The longer dimension of the fenced area is feet.

14. Use the Pythagorean Theorem to find the lengths of the sides of the triangle.



The length of the shorter leg of the triangle is units.

The length of the longer leg of the triangle is units.