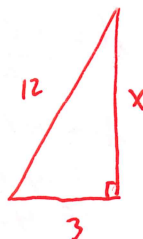


Solve each of the following. Please draw a picture and use the Pythagorean Theorem to solve. **Be sure to label all answers and leave answers in exact simplified form.**

1. The bottom of a ladder must be placed 3 feet from a wall. The ladder is 12 feet long. How far above the ground does the ladder touch the wall?



$$3^2 + x^2 = 12^2$$

$$9 + x^2 = 144$$

$$\begin{array}{r} -9 \\ -9 \end{array}$$

$$x^2 = 135$$

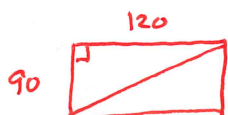
$$x = \sqrt{135}$$

$$x = \sqrt{9 \cdot 15}$$

$$x = \sqrt{9} \sqrt{15}$$

$x = 3\sqrt{15} \text{ ft}$

2. A soccer field is a rectangle 90 meters wide and 120 meters long. The coach asks players to run from one corner to the corner diagonally across the field. How far do the players run?



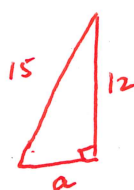
$$90^2 + 120^2 = c^2$$

$$8100 + 14400 = c^2$$

$$\sqrt{22500} = \sqrt{c^2}$$

$150 \text{ m} = c$

3. How far from the base of the house do you need to place a 15' ladder so that it exactly reaches the top of a 12' wall?



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


$$a^2 + 144 = 225$$

$$\begin{array}{r} -144 \\ -144 \end{array}$$

$$a^2 = 81$$

$a = 9'$

4. What is the length of the diagonal of a 10 cm by 15 cm rectangle?



$$10^2 + 15^2 = c^2$$

$$100 + 225 = c^2$$

$$325 = c^2$$

$$\sqrt{325} = c$$

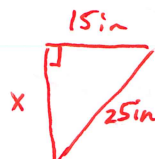
$$\sqrt{25 \cdot 13} = c$$

$$\sqrt{25} \sqrt{13} = c$$

$$5\sqrt{13} = c$$

$5\sqrt{13} \text{ cm} = c$

5. The diagonal of a rectangle is 25 in. The width is 15 in. What is the area of the rectangle?



$$15^2 + x^2 = 25^2$$

$$225 + x^2 = 625$$

$$\begin{array}{r} -225 \\ -225 \end{array}$$

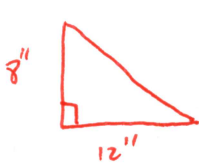
$$\sqrt{x^2} = \sqrt{400}$$

$$x = 20$$

$$A = 20 \cdot 15$$

$A = 300 \text{ in}^2$

6. Two sides of a right triangle are 8" and 12".  
 A. Find the the area of the triangle if 8 and 12 are legs.



$$A = \frac{8 \cdot 12}{2}$$

$$A = 48 \text{ in}^2$$

- B. Find the area of the triangle if 8 and 12 are a leg and hypotenuse.



$$8^2 + b^2 = 12^2$$

$$64 + b^2 = 144$$

$$-64 \quad -64$$

$$\sqrt{b^2 = 80}$$

$$b = \sqrt{80}$$

$$A = \frac{8\sqrt{80}}{2}$$

$$A = 4\sqrt{80}$$

$$= 4\sqrt{16 \cdot 5}$$

$$= 4 \cdot 4\sqrt{5} = 16\sqrt{5} \text{ in}^2$$

7. The area of a square is 81 cm<sup>2</sup>. Find the perimeter of the square.



$$A = s^2$$

$$\sqrt{81} = \sqrt{s^2}$$

$$9 = s$$

$$P = 4s$$

$$= 4 \cdot 9$$

$$P = 36 \text{ cm}$$

8. An isosceles triangle has congruent sides of 20 cm. The base is 10 cm. What is the area of the triangle?

$$5^2 + b^2 = 20^2$$

$$25 + b^2 = 400$$

$$-25 \quad -25$$

$$b^2 = 375$$

$$b = \sqrt{375}$$

$$A = \frac{bh}{2}$$

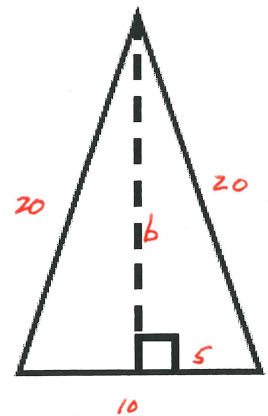
$$= \frac{10\sqrt{375}}{2}$$

$$A = 5\sqrt{25 \cdot 15}$$

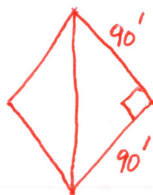
$$= 5\sqrt{25} \sqrt{15}$$

$$= 5 \cdot 5 \sqrt{15}$$

$$A = 25\sqrt{15} \text{ cm}^2$$



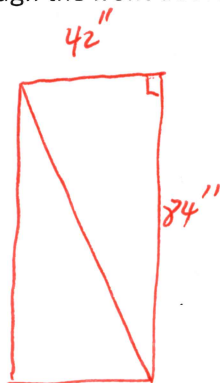
9. A baseball diamond is a square that is 90' on each side. If a player throws the ball from 2<sup>nd</sup> base to home, how far will the ball travel?



$$C = a\sqrt{2}$$

$$C = 90\sqrt{2} \text{ ft}$$

10. Jill's front door is 42" wide and 84" tall. She purchased a circular table that is 96 inches in diameter. Will the table fit through the front door?



$$42^2 + 84^2 = C^2$$

$$1764 + 7056 = C^2$$

$$\sqrt{8820} = \sqrt{C^2}$$

$$93.9 \approx C$$

$$93.9 < 96$$

WILL NOT FIT