

Pythagorean Theorem: Word Problems

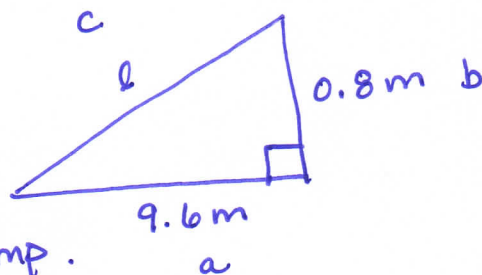
$$\text{FORMULA: } c^2 = a^2 + b^2$$

Examples:

1. A ramp is to be constructed with a base length of 9.6m and height of 0.8m. What is the length of the ramp along its surface?

Solution:

1. Make a diagram
2. Label your sides c, a, and b
3. Write out your formula
4. Substitute the known values into the formula
5. Solve for the unknown



Let c rep. length of ramp.

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

$$c^2 = (9.6)^2 + (0.8)^2$$

$$c^2 = 92.8$$

$$c = 9.6m$$

$\therefore$ length of ramp is 9.6m.

2. Each side of a checkerboard measures 40 cm. What is the length of its diagonal?

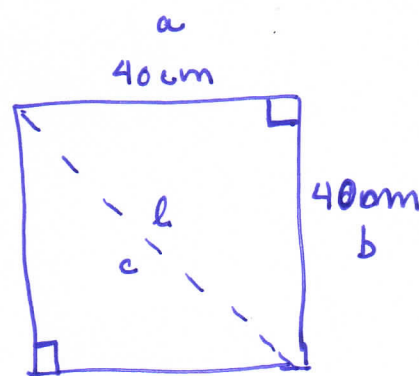
Let c rep length of diagonal.

$$c^2 = (40)^2 + (40)^2$$

$$c^2 = 3200$$

$$c = 56.6cm$$

$\therefore$ length is 56.6cm.



Pythagorean Theorem: Word Problems

3. The bottom of a 4.0m ladder is 1 meter away from the base of a wall. How high does the ladder go up the wall?

Let h rep. height of ladder up wall.

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

$$(4)^2 = (1)^2 + h^2$$

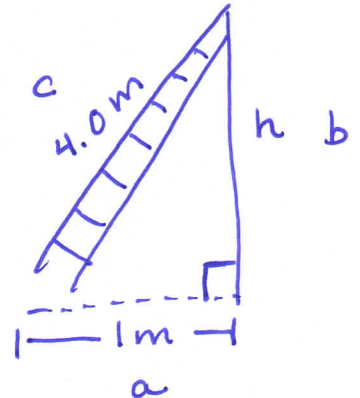
$$16 = 1 + h^2$$

$$16 - 1 = h^2$$

$$15 = h^2$$

$$\boxed{3.9 = h}$$

$\therefore$ height is 3.9 m.



4. A boat leaves a dock and sails 8km north and then 13 km east. How far is the boat from the dock?

Let x rep. distance from dock.

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

$$x^2 = (8)^2 + (13)^2$$

$$x^2 = 233$$

$$\boxed{x = 15.3}$$

$\therefore$ distance boat is from dock is 15.3 km.

