

PYTHAGOREAN THEOREM WORD PROBLEMS (GIVEN HYPOTENUSE) WORKSHEET

1. The mast of a sailboat is 15 meters high. If the mast forms a right angle with the deck and the diagonal support rope is 17 meters long, how far is the other end of the rope from the base of the mast?

2. A satellite dish on a rooftop has a diagonal brace that is 10 feet long. If the dish is mounted 8 feet above the roof, how far from the wall is the base of the brace?

3. A 6-metre vertical ladder connects to the top of a slide at a playground. The slide is 10 meters long. How far from the base of the slide is the ladder?

4. In a construction project, a roof has a diagonal beam to support it. The length of the diagonal beam is 13 meters, and the horizontal distance from the edge of the roof to the point where the beam connects is 5 meters. How high above the ground is the connection point of the diagonal beam?

5. A soccer goalpost stands 7 feet tall. A diagonal brace is used to provide stability and is 13 feet long. How far from the base of the goalpost does the diagonal brace attach to the ground to the nearest metre?

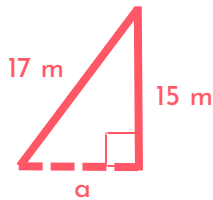
6. A flagpole in a schoolyard is 30 feet high. A rope is used to raise and lower the flag and forms a right triangle with the ground. If the rope is 40 feet long, how far from the base of the flagpole does the rope touch the ground?

7. A rectangular garden bed has a diagonal wooden support beam that is 15 feet long. The length of the rectangular bed is 12 feet. What is the width of the rectangular bed?

8. A computer screen has a diagonal length of 24 inches. The height of the screen is 18 inches. What is the width of the screen?

ANSWERS

1. The mast of a sailboat is 15 meters high. If the mast forms a right angle with the deck and the diagonal support rope is 17 meters long, how far is the other end of the rope from the base of the mast?



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

$$a^2 = c^2 - b^2$$

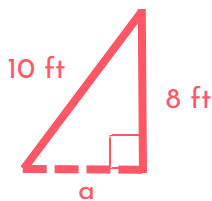
$$a^2 = 17^2 - 15^2$$

$$a = \sqrt{64}$$

$$a = 8 \text{ m}$$

Therefore the other end of the rope is 8 metres from the base of the mast.

2. A satellite dish on a rooftop has a diagonal brace that is 10 feet long. If the dish is mounted 8 feet above the roof, how far from the wall is the base of the brace?



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

$$a^2 = c^2 - b^2$$

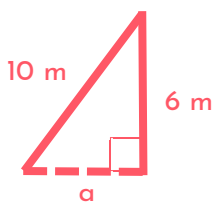
$$a^2 = 10^2 - 8^2$$

$$a = \sqrt{36}$$

$$a = 6 \text{ ft}$$

Therefore the base of the brace is 6 feet from the wall.

3. A 6-metre vertical ladder connects to the top of a slide at a playground. The slide is 10 meters long. How far from the base of the slide is the ladder?



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

$$a^2 = c^2 - b^2$$

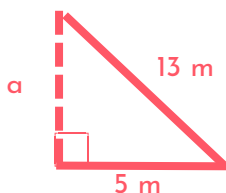
$$a^2 = 10^2 - 6^2$$

$$a = \sqrt{64}$$

$$a = 8 \text{ m}$$

Therefore the ladder is 8 metres from the base of the slide.

4. In a construction project, a roof has a diagonal beam to support it. The length of the diagonal beam is 13 meters, and the horizontal distance from the edge of the roof to the point where the beam connects is 5 meters. How high above the ground is the connection point of the diagonal beam?



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

$$a^2 = c^2 - b^2$$

$$a^2 = 13^2 - 5^2$$

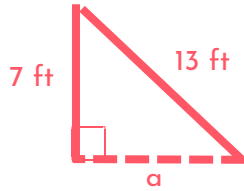
$$a = \sqrt{144}$$

$$a = 12 \text{ m}$$

Therefore the connection point of the diagonal beam is 12 metres above the ground.

ANSWERS

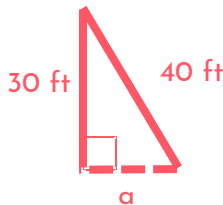
5. A soccer goalpost stands 7 feet tall. A diagonal brace is used to provide stability and is 13 feet long. How far from the base of the goalpost does the diagonal brace attach to the ground to the nearest metre?



$$\begin{aligned}a^2 + b^2 &= c^2 \\a^2 &= c^2 - b^2 \\a^2 &= 13^2 - 7^2 \\a &= \sqrt{120} \\a &= 11 \text{ m}\end{aligned}$$

Therefore the diagonal brace attaches to the ground approximately 11 metres from the base of the goalpost.

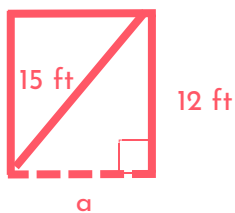
6. A flagpole in a schoolyard is 30 feet high. A rope is used to raise and lower the flag and forms a right triangle with the ground. If the rope is 40 feet long, how far from the base of the flagpole does the rope touch the ground?



$$\begin{aligned}a^2 + b^2 &= c^2 \\a^2 &= c^2 - b^2 \\a^2 &= 40^2 - 30^2 \\a &= \sqrt{700} \\a &= 26.46 \text{ ft}\end{aligned}$$

Therefore the rope touches the ground 26.46 feet from the base of the flagpole.

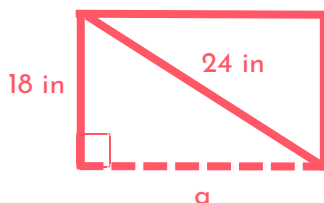
7. A rectangular garden bed has a diagonal wooden support beam that is 15 feet long. The length of the rectangular bed is 12 feet. What is the width of the rectangular bed?



$$\begin{aligned}a^2 + b^2 &= c^2 \\a^2 &= c^2 - b^2 \\a^2 &= 15^2 - 12^2 \\a &= \sqrt{81} \\a &= 9 \text{ ft}\end{aligned}$$

Therefore the width of the rectangular bed is 9 feet.

8. A computer screen has a diagonal length of 24 inches. The height of the screen is 18 inches. What is the width of the screen?



$$\begin{aligned}a^2 + b^2 &= c^2 \\a^2 &= 24^2 - 18^2 \\a^2 &= 15^2 - 12^2 \\a &= \sqrt{252} \\a &= 15.87 \text{ in}\end{aligned}$$

Therefore the width of the screen is 15.87 inches.



MATHBYTHEPIXEL.COM

