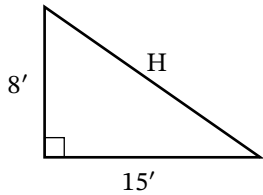


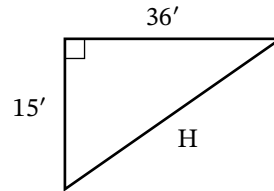
Use the Pythagorean theorem to find the length of the unknown side.

1.



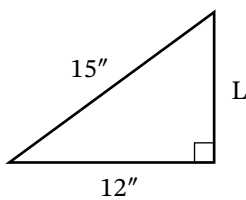
$$\begin{aligned} 8^2 + 15^2 &= H^2 \\ 64 \text{ ft}^2 + 225 \text{ ft}^2 &= H^2 \\ 289 \text{ ft}^2 &= H^2 \\ 17 \text{ ft} &= H \end{aligned}$$

6.



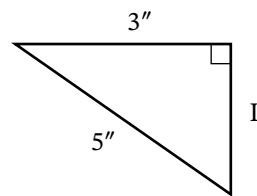
$$\begin{aligned} 15^2 + 36^2 &= H^2 \\ 225 + 1,296 &= H^2 \\ 1,521 &= H^2 \\ 39' &= H \end{aligned}$$

2.



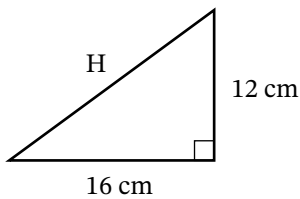
$$\begin{aligned} 12^2 + L^2 &= 15^2 \\ 144 + L^2 &= 225 \\ L^2 &= 81 \\ L &= 9'' \end{aligned}$$

7.



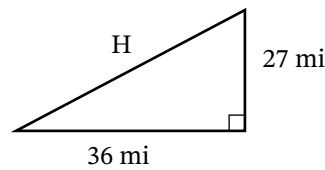
$$\begin{aligned} 3^2 + L^2 &= 5^2 \\ 9 + L^2 &= 25 \\ L^2 &= 16 \\ L &= 4'' \end{aligned}$$

3.



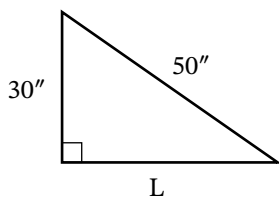
$$\begin{aligned} 12^2 + 16^2 &= H^2 \\ 144 + 256 &= H^2 \\ 400 &= H^2 \\ 20 \text{ cm} &= H \end{aligned}$$

8.



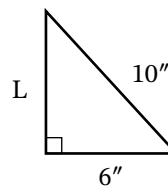
$$\begin{aligned} 27^2 + 36^2 &= H^2 \\ 729 + 1,296 &= H^2 \\ 2,025 &= H^2 \\ 45 \text{ mi} &= H \end{aligned}$$

4.



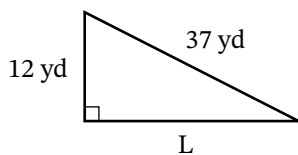
$$\begin{aligned} 30^2 + L^2 &= 50^2 \\ 900 + L^2 &= 2,500 \\ L^2 &= 1,600 \\ L &= 40'' \end{aligned}$$

9.



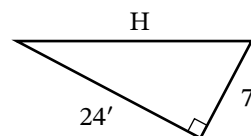
$$\begin{aligned} 6^2 + L^2 &= 10^2 \\ 36 + L^2 &= 100 \\ L^2 &= 64 \\ L &= 8'' \end{aligned}$$

5.



$$\begin{aligned} 12^2 + L^2 &= 37^2 \\ 144 + L^2 &= 1,369 \\ L^2 &= 1,225 \\ L &= 35 \text{ yd} \end{aligned}$$

10.



$$\begin{aligned} 7^2 + 24^2 &= H^2 \\ 49 + 576 &= H^2 \\ 625 &= H^2 \\ 25' &= H \end{aligned}$$

Use the Pythagorean theorem to see if the lengths given represent a right triangle.

11. 2, 4, 6

$$\begin{aligned} 2^2 + 4^2 &= 6^2 \\ 4 + 16 &= 36 \\ 20 &= 36 \end{aligned}$$

This is not a right triangle.

12. 18, 24, 30

$$\begin{aligned} 18^2 + 24^2 &= 30^2 \\ 324 + 576 &= 900 \\ 900 &= 900 \end{aligned}$$

This is a right triangle.

13. 9, 40, 41

$$\begin{aligned} 9^2 + 40^2 &= 41^2 \\ 81 + 1,600 &= 1,681 \\ 1,681 &= 1,681 \end{aligned}$$

This is a right triangle.

14. 7, 21, 25

$$\begin{aligned} 7^2 + 21^2 &= 25^2 \\ 49 + 441 &= 625 \\ 490 &= 625 \end{aligned}$$

This is not a right triangle.

15. 20, 21, 29

$$\begin{aligned} 20^2 + 21^2 &= 29^2 \\ 400 + 441 &= 841 \\ 841 &= 841 \end{aligned}$$

This is a right triangle.

16. 1, 3, 4

$$\begin{aligned} 1^2 + 3^2 &= 4^2 \\ 1 + 9 &= 16 \\ 10 &= 16 \end{aligned}$$

This is not a right triangle.

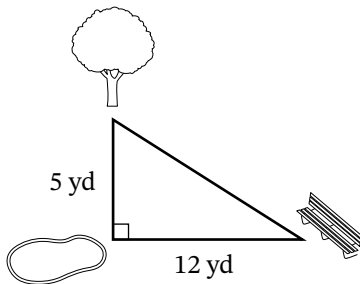
17. 20, 48, 52

$$\begin{aligned} 20^2 + 48^2 &= 52^2 \\ 400 + 2,304 &= 2,704 \\ 2,704 &= 2,704 \end{aligned}$$

This is a right triangle.

Solve each word problem.

18. Determine the distance to walk diagonally across the park on the walkway from the bench to the tree.



$$\begin{aligned} 5^2 + 12^2 &= H^2 \\ 25 + 144 &= H^2 \\ 169 &= H^2 \\ 13 \text{ yd} &= H \end{aligned}$$

19. Mica said that a triangle with sides 45 cm, 60 cm, and 75 cm is a right triangle.

Use the Pythagorean theorem to determine if he is correct or not.

$$\begin{aligned} 45^2 + 60^2 &= 75^2 \\ 2,025 + 3,600 &= 5,625 \\ 5,625 &= 5,625 \end{aligned}$$

Mica is correct. This is a right triangle.

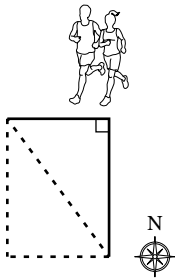
20. To wash a window that is 8 meters off the ground, Brianna leans a 10-meter ladder against the side of the building. To reach the window, how far away from the building should Brianna place the base of the ladder?

$$\begin{aligned} 8^2 + L^2 &= 10^2 \\ 64 + L^2 &= 100 \\ L^2 &= 36 \\ L &= 6 \text{ m} \end{aligned}$$

21. Olivia is about to ride down a straight water slide. The length of the water slide itself is 50 feet. The splash pool at the end of the slide is 14 feet away from the base of the tower that leads up to the launching platform. Find the height of the launching platform.

$$\begin{aligned} 14^2 + L^2 &= 50^2 \\ 196 + L^2 &= 2,500 \\ L^2 &= 2,304 \\ L &= 48' \end{aligned}$$

22. Two runners training for a marathon ran 8 miles north and then 6 miles west. What is the shortest distance they can travel to return to their starting point?



$$\begin{aligned} 8^2 + 6^2 &= H^2 \\ 64 + 36 &= H^2 \\ 100 &= H^2 \\ 10 \text{ mi} &= H \end{aligned}$$

23. In Demmetown, the library is due south of the ice cream shop and due west of the community swimming pool. If the distance between the library and the ice cream shop is 5 miles and the distance between the ice cream shop and the community pool is 13 miles, how far is the library from the community pool?

$$\begin{aligned} 5^2 + L^2 &= 13^2 \\ 25 + L^2 &= 169 \\ L^2 &= 144 \\ L &= 12 \text{ mi} \end{aligned}$$

24. Henry says that a right triangle with leg lengths 16 inches and 30 inches, has a hypotenuse that would be 32 inches long. Use the Pythagorean theorem to tell if Henry is correct or not.

$$\begin{aligned} 16^2 + 30^2 &= H^2 \\ 256 + 900 &= H^2 \\ 1,156 &= H^2 \\ 32 \text{ in} &= H \end{aligned}$$

25. Tricia is building a wheelchair ramp onto her front porch. The porch begins at ground level and is 32 inches high. Tricia wants the ramp to start 24 inches from the porch. How long does the ramp need to be?

$$\begin{aligned} 32^2 + 24^2 &= H^2 \\ 1,024 + 576 &= H^2 \\ 1,600 &= H^2 \\ 40'' &= H \end{aligned}$$