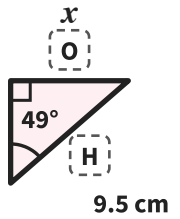
Trigonometry: Finding the Opposite with Sine

ANSWERS

1

Find x to 2 decimal places.



$\sin$ [49] $° = \frac{x}{9.5}$

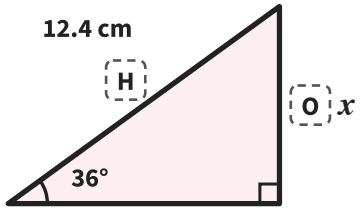
Multiply both sides by the hypotenuse.

$x = 9.5 \times \sin 49°$

$x =$ 7.17 cm

2

Find x to 2 decimal places.



$\sin$ [36] $° = \frac{x}{12.4}$

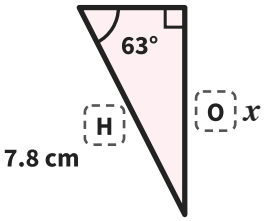
Multiply both sides by the hypotenuse.

$x = 12.4 \times \sin 36°$

$x =$ 7.29 cm

3

Find x to 2 decimal places.



$\sin$ [63] $° = \frac{x}{7.8}$

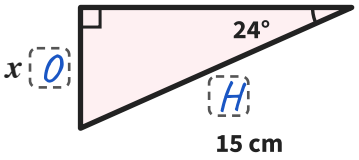
Multiply both sides by the hypotenuse.

$x = 7.8 \times \sin 63°$

$x =$ 6.95 cm

4

Label O and H, then find x to 2 decimal places.



$\sin$ [24] $° = \frac{x}{15}$

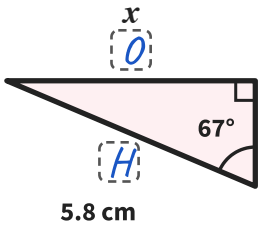
Multiply both sides by the hypotenuse.

$x = 15 \times \sin 24°$

$x =$ 6.10 cm

5

Label O and H, then find x to 2 decimal places.



$\sin$ [67] $° = \frac{x}{5.8}$

Multiply both sides by the hypotenuse.

$x = 5.8 \times \sin 67°$

$x =$ 5.34 cm

6

The hypotenuse is 10 cm and the angle is 41°. Ali types 10 × sin 41 into a calculator to find the opposite and gets −1.59. Explain how you know Ali is wrong, then find the opposite to 2 decimal places.

Negative length: it was in radians

$x = 10 \times \sin 41°$

Answer 6.56 cm

7

A roof rafter is 4.2 m long and slopes at 38° to the horizontal. How high is the top of the rafter above its bottom end? Give your answer to 2 decimal places.

$\sin 38° = \frac{x}{4.2}$

$x = 4.2 \times \sin 38°$

Answer 2.59 m

8

A straight zip wire is 85 m long. It slopes down at 9° to the horizontal. How far does a rider drop from the top to the bottom? Give your answer to 2 decimal places.

$\sin 9° = \frac{x}{85}$

$x = 85 \times \sin 9°$

Answer 13.30 m

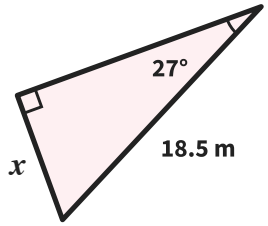
Trigonometry: Finding the Opposite with Sine

further practice

ANSWERS

9

Find x to 2 decimal places.



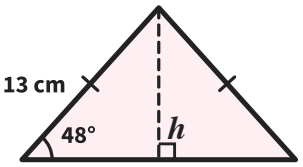
$\sin 27° = \frac{x}{18.5}$

$x = 18.5 \times \sin 27°$

$x =$ 8.40 m

10

The triangle is isosceles. Find its height, h, to 2 decimal places.



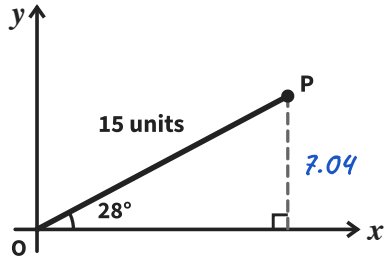
$\sin 48° = \frac{h}{13}$

$h = 13 \times \sin 48°$

$h =$ 9.66 cm

11

The line OP is 15 units long. It makes an angle of 28° with the x axis. Find the y coordinate of P, to 2 decimal places.



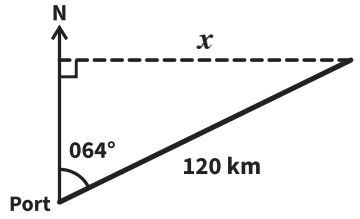
$\sin 28° = \frac{y}{15}$

$y = 15 \times \sin 28°$

$y =$ 7.04

12

A boat leaves port and sails 120 km in a straight line on a bearing of 064°.
How far east of the port is it?
Give your answer to 2 decimal places.



$\sin 64° = \frac{x}{120}$

$x = 120 \times \sin 64°$

$x =$ 107.86 km

13

A crane's straight jib is 32 m long.
It pivots 4 m above the ground and is raised to 58° above the horizontal.
Can the end of the jib reach above a roof 30 m high? Show how you know.

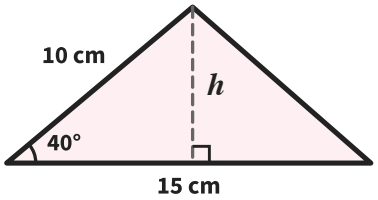
$32 \times \sin 58° = 27.14$

$27.14 + 4 = 31.14$ m

Answer Yes, 31.14 m > 30 m

14

Find the height h of the triangle.
Then find its area, to 2 decimal places.



$h = 10 \times \sin 40° = 6.428$

area $= \frac{1}{2} \times 15 \times 6.428$

Area = 48.21 cm^2

15

Slide A is 3.8 m long at 36° to the ground. Slide B is 4.3 m long at 30°.
Both are straight and start at ground level. Which slide has the higher top, and by how much?
Give your answer to 2 decimal places.

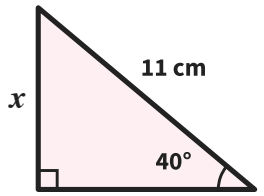
A: $3.8 \times \sin 36° = 2.23$

B: $4.3 \times \sin 30° = 2.15$

Answer A, by 0.08 m

16

Sam writes $\sin 40° = \frac{11}{x}$, so **x = 17.11 cm**. Explain how you know Sam is wrong. Then find x to 2 decimal places.



x is the opposite, so x goes on top

so x must be less than 11 cm

$x =$ 7.07 cm