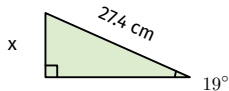


Push Tasks — Answers



Use SOH CAH TOA to find the missing side, labelled x . Give each answer to 2 decimal places.

1.



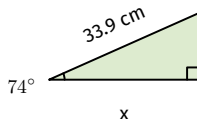
Solution

SOH

$$x = 27.4 \sin 19^\circ$$

$$x \approx 8.92 \text{ cm}$$

2.



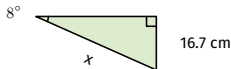
Solution

CAH

$$x = 33.9 \cos 74^\circ$$

$$x \approx 9.34 \text{ cm}$$

3.



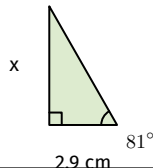
Solution

SOH

$$x = 16.7 \div \sin 8^\circ$$

$$x \approx 119.99 \text{ cm}$$

4.



Solution

TOA

$$x = 2.9 \tan 81^\circ$$

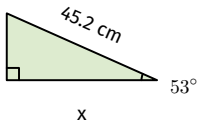
$$x \approx 18.31 \text{ cm}$$

Push Tasks — Answers



Use SOH CAH TOA to find the missing side, labelled x . Give each answer to 2 decimal places.

5.



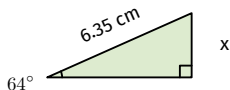
Solution

CAH

$$x = 45.2 \cos 53^\circ$$

$$x \approx 27.20 \text{ cm}$$

6.



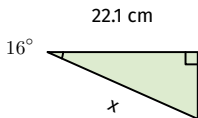
Solution

SOH

$$x = 6.35 \sin 64^\circ$$

$$x \approx 5.71 \text{ cm}$$

7.



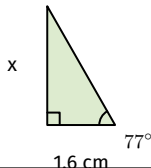
Solution

CAH

$$x = 22.1 \div \cos 16^\circ$$

$$x \approx 22.99 \text{ cm}$$

8.



Solution

TOA

$$x = 1.6 \tan 77^\circ$$

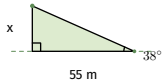
$$x \approx 6.93 \text{ cm}$$

Push Tasks — Answers



These are angle-of-elevation and angle-of-depression scenes. Give each answer to 2 decimal places.

9.

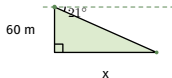


A drone hovers above a landmark. Find its height.

Solution

$$\begin{aligned}\text{TOA: height} \\ &= 55 \tan 38^\circ \approx 42.97 \\ &\text{m}\end{aligned}$$

10.



Find the horizontal distance from the cliff to the boat.

Solution

$$\begin{aligned}\text{TOA: distance} &= \\ &60 \div \tan 21^\circ \approx 156.31 \\ &\text{m}\end{aligned}$$

11. A ladder leans against a wall at 70° to the ground, reaching a height of 5.8 m. Find (a) the length of the ladder and (b) the horizontal distance from the foot of the ladder to the wall.

Solution

(a) SOH: $5.8 \div \sin 70^\circ \approx 6.17$ m

(b) TOA: $5.8 \div \tan 70^\circ \approx 2.11$ m

12. A hiking trail rises at a constant angle of 11° and has a horizontal map distance of 850 m. Find (a) the length of the trail itself and (b) the total height gained.

Solution

(a) CAH: $850 \div \cos 11^\circ \approx 865.91$ m

(b) TOA: $850 \tan 11^\circ \approx 165.22$ m

Push Tasks — Answers



Give each answer to 2 decimal places unless told otherwise.

13. From a point 30 m from the base of a tree, the angle of elevation to its top is 27° . From a point 18 m from the same base, the angle of elevation to a bird on a branch is 38° . Find (a) the height of the tree and (b) the height of the branch.

Solution

(a) TOA: $30 \tan 27^\circ \approx 15.29$ m

(b) TOA: $18 \tan 38^\circ \approx 14.06$ m

15. A roof strut makes an angle of 24° with the horizontal ceiling joist and must reach a vertical height of 1.35 m. Find (a) the length of the strut and (b) the horizontal distance it spans.

Solution

(a) SOH: $1.35 \div \sin 24^\circ \approx 3.32$ m

(b) TOA: $1.35 \div \tan 24^\circ \approx 3.03$ m

14. Explain why, for a fixed hypotenuse length, the side opposite the marked angle gets longer as the angle increases from 0° towards 90° .

Solution

Opposite = $H \sin A$. As A rises from 0° to 90° , $\sin A$ rises from 0 to 1, so the opposite side grows from 0 up to the full hypotenuse length.

16. A cable car travels in a straight line from a base station to a mountain station 1250 m higher, along a route inclined at 31° to the horizontal. Find, to the nearest metre, (a) the length of the route and (b) the horizontal ground distance it covers.

Solution

(a) SOH: $1250 \div \sin 31^\circ \approx 2427$ m

(b) TOA: $1250 \div \tan 31^\circ \approx 2080$ m