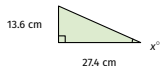


Push Tasks — Answers



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

1.



Solution

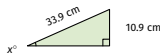
opp = 13.6, adj = 27.4
(TOA)

$$\tan x = 13.6/27.4$$

$$x = \tan^{-1}(0.496) \approx$$

$$26.40^\circ$$

2.



Solution

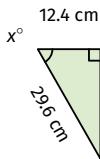
opp = 10.9, hyp = 33.9
(SOH)

$$\sin x = 10.9/33.9$$

$$x = \sin^{-1}(0.322) \approx$$

$$18.76^\circ$$

3.



Solution

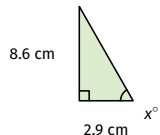
adj = 12.4, hyp = 29.6
(CAH)

$$\cos x = 12.4/29.6$$

$$x = \cos^{-1}(0.419) \approx$$

$$65.23^\circ$$

4.



Solution

opp = 8.6, adj = 2.9
(TOA)

$$\tan x = 8.6/2.9$$

$$x = \tan^{-1}(2.966) \approx$$

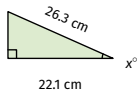
$$71.37^\circ$$

Push Tasks — Answers



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

5.



Solution

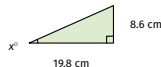
adj = 22.1, hyp = 26.3
(CAH)

$$\cos x = 22.1/26.3$$

$$x = \cos^{-1}(0.840) \approx$$

$$37.83^\circ$$

6.



Solution

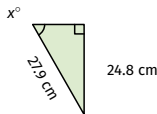
opp = 8.6, adj = 19.8
(TOA)

$$\tan x = 8.6/19.8$$

$$x = \tan^{-1}(0.434) \approx$$

$$23.48^\circ$$

7.



Solution

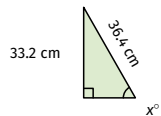
opp = 24.8, hyp = 27.9
(SOH)

$$\sin x = 24.8/27.9$$

$$x = \sin^{-1}(0.889) \approx$$

$$62.73^\circ$$

8.



Solution

opp = 33.2, hyp = 36.4
(SOH)

$$\sin x = 33.2/36.4$$

$$x = \sin^{-1}(0.912) \approx$$

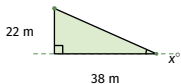
$$65.80^\circ$$

Push Tasks — Answers

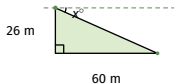


These are angle-of-elevation and angle-of-depression scenes. Give each answer to 2 decimal places.

- 9. Solution** opp = 22, adj = 38 (TOA);
 $x = \tan^{-1}(22/38) \approx 30.07^\circ$



- 10. Solution** opp = 26, adj = 60 (TOA); $x = \tan^{-1}(26/60) \approx 23.43^\circ$



- 11.** A ladder 9.4 m long leans at 63° . (a) Find the height reached, to 2 d.p. (b) From a point 3.1 m from the wall, find the angle of elevation to the ladder's top, to 2 d.p.

Solution

- (a) height = $9.4 \sin(63^\circ) \approx 8.38$ m
(b) $\tan x = 8.38/3.1$, so $x \approx 69.69^\circ$

- 12.** Without using a calculator, find the exact size of angle y if $\tan(y) = 1$.

Solution

Opposite = adjacent, so the right triangle is isosceles.

$\tan(45^\circ) = 1$, hence $y = 45^\circ$ (exact).

Push Tasks — Answers



Give each answer to 2 decimal places unless the angle is exact.

13. Without using a calculator, find the exact size of angle y if $\sin(y) = \frac{\sqrt{3}}{2}$.

Solution

$\sin(60^\circ) = \frac{\sqrt{3}}{2}$, hence $y = 60^\circ$ (exact).

15. A student enters $\sin^{-1}(1.5)$ into a calculator and gets an error. Explain, referring to the possible values of $\sin(A)$ for an angle A , why no such angle exists.

Solution

$\sin(A) = \text{opp/hyp}$ and $\text{opp} \leq \text{hyp}$, so $-1 \leq \sin(A) \leq 1$ for every angle A . As $1.5 > 1$, no such angle exists.

14. Without using a calculator, find the exact size of angle y if $\cos(y) = \frac{\sqrt{3}}{2}$.

Solution

$\cos(30^\circ) = \frac{\sqrt{3}}{2}$, hence $y = 30^\circ$ (exact).

16. A tree is 15 m tall. (a) Find the angle of elevation to its top from 30 m away. (b) A bird sits 12 m up the same tree. Find the angle of elevation to the bird from 18 m away.

Solution

(a) $\tan x = 15/30$, so $x \approx 26.57^\circ$

(b) $\tan x = 12/18$, so $x \approx 33.69^\circ$