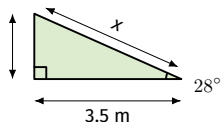


# A Carport Roof's Rafter Length



Use SOHCAHTOA to find the missing length. The angle is measured from the horizontal.



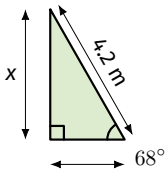
**Question 1.** A carport roof rises from the low side to the high side at a pitch angle of  $28^\circ$ . The horizontal run of the roof is 3.5 m, as shown.

- (a) Use SOHCAHTOA to calculate the length of the sloping rafter, correct to 1 decimal place.
- (b) A fascia board is fitted along the whole length of the rafter, costing \$12.60 per metre. Find the total cost, to the nearest cent.

# A Ladder's Reach Up a Shed Wall



Use SOHCAHTOA to find the missing length. The angle is measured from the ground.



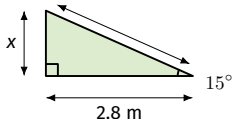
**Question 2.** A ladder 4.2 m long leans against a shed wall, making an angle of  $68^\circ$  with the ground, as shown.

- (a) Calculate the height the ladder reaches up the wall, correct to 1 decimal place.
- (b) The shed's gutter is 3.8 m above the ground. Does the ladder reach the gutter? Justify your answer using your calculated height.

# A Loading Ramp's Rise



Use SOHCAHTOA to find the missing length. The angle is measured from the ground.



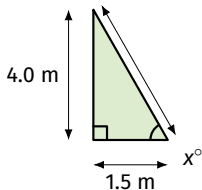
**Question 3.** A loading ramp for a farm trailer makes an angle of  $15^\circ$  with the ground and has a horizontal run of 2.8 m, as shown.

- (a) Calculate the vertical rise of the ramp, correct to 2 decimal places.
- (b) The trailer's loading deck is 0.60 m above the ground. Does the ramp rise high enough to reach the deck? Justify your answer.

# Checking an Extension Ladder's Angle



Use SOHCAHTOA to find the missing angle.



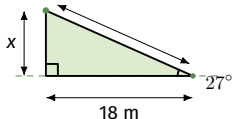
**Question 4.** An extension ladder's foot is 1.5 m from the wall, and it reaches 4.0 m up the wall, as shown.

- (a) Use SOHCAHTOA to calculate the angle the ladder makes with the ground, correct to 1 decimal place.
- (b) The ladder's manufacturer states it is safe to use only between  $65^\circ$  and  $80^\circ$  from the ground. Is this ladder within the safe range?

# A Surveyor's Sight-Line to a Building



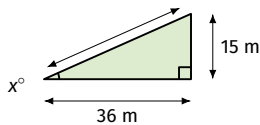
Use SOHCAHTOA to find the missing length. The angle of elevation is measured from the horizontal.



**Question 5.** A surveyor stands 18 m from the base of a building. The angle of elevation to the top of the building is  $27^\circ$ , as shown.

- (a) Calculate the height of the building, correct to 1 decimal place.
- (b) A window-cleaning company charges \$18.00 per metre of building height. Using the full-precision height, find the total cost, to the nearest cent.

# A Zip-Line's Angle of Descent



**Question 6.** A zip-line cable runs from a high platform to a lower platform. The horizontal distance between the platforms is 36 m, and the platforms differ in height by 15 m, as shown.

- (a) Decide which trigonometric ratio to use, then calculate the angle the cable makes with the horizontal, correct to 1 decimal place.
- (b) Using your angle from (a), calculate the length of cable needed, correct to 1 decimal place.
- (c) The cable costs \$6.20 per metre. Find the total cost, to the nearest cent.