

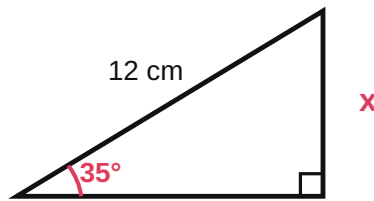
Boost Free Lessons - Year 9 Maths

Lesson 14: Finding Unknown Side

Name: _____ Grade: _____ Date: _____

Worked Example 1

Find x in the triangle below, correct to 1 decimal place.



1. Label the sides relative to the 35° angle. x is the opposite side, and 12 cm is the hypotenuse.
2. Opposite and Hypotenuse means use sin: $\sin 35^\circ = \frac{x}{12}$.
3. Multiply both sides by 12: $x = 12 \times \sin 35^\circ$.
4. $12 \times 0.5736 = 6.88\dots$

$x \approx 6.9$ cm

Worked Example 2

A right-angled triangle has an angle of 50° , an adjacent side of 9 m, and an unknown opposite side x . Find x , correct to 1 decimal place.

1. Opposite and Adjacent means use tan: $\tan 50^\circ = \frac{x}{9}$.
2. Multiply both sides by 9: $x = 9 \times \tan 50^\circ$.
3. $9 \times 1.1918 = 10.72\dots$
4. Only round at the very end, never partway through.

$x \approx 10.7$ m

Remember: Label the sides relative to the given angle first, then pick the ratio that uses the side you know and the side you want. If the unknown is on the bottom of the fraction, multiply up before dividing.



Question 1: Find x, correct to 1 decimal place.

1. $\sin 30^\circ = \frac{x}{10}$

2. $\cos 60^\circ = \frac{x}{8}$

3. $\tan 45^\circ = \frac{x}{7}$

4. $\sin 40^\circ = \frac{x}{15}$

5. $\cos 25^\circ = \frac{x}{20}$

6. $\tan 55^\circ = \frac{x}{6}$

7. $\sin 65^\circ = \frac{x}{9}$

8. $\cos 38^\circ = \frac{x}{14}$



Question 2: Find the side described, correct to 1 decimal place.

1. Angle 28° , hypotenuse 20 cm. Find the opposite side.

2. Angle 62° , adjacent 11 m. Find the opposite side.

3. Angle 45° , hypotenuse 16 cm. Find the adjacent side.

4. Angle 33° , adjacent 25 m. Find the hypotenuse.

5. Angle 70° , opposite 12 cm. Find the hypotenuse.

6. Angle 18° , opposite 5 m. Find the adjacent side.



Question 3: Answer the following questions, correct to 1 decimal place.

1. A ladder leans at 70° to the ground and reaches 4.5 m up a wall. How long is the ladder?
2. A ramp rises at 8° over a horizontal distance of 12 m. How high does it rise?
3. A kite string is 40 m long and makes an angle of 55° with the ground. How high is the kite?
4. A tree casts a shadow 15 m long when the sun is at an angle of 40° . How tall is the tree?
5. A slide is 6 m long and set at 35° to the ground. How far is the bottom of the slide from the base of the ladder?





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Answers: Finding Unknown Side**Question 1**

- | | |
|--------------|---------------|
| 1. $x = 5.0$ | 5. $x = 18.1$ |
| 2. $x = 4.0$ | 6. $x = 8.6$ |
| 3. $x = 7.0$ | 7. $x = 8.2$ |
| 4. $x = 9.6$ | 8. $x = 11.0$ |

Question 2

- | | |
|------------|------------|
| 1. 9.4 cm | 4. 29.8 m |
| 2. 20.7 m | 5. 12.8 cm |
| 3. 11.3 cm | 6. 15.4 m |

Question 3

1. 4.8 m
2. 1.7 m
3. 32.8 m
4. 12.6 m
5. 4.9 m

