

Use Tangent to Find a Length

Maths

Miss Davies



Use Tangent to Find a Length

1. Complete the working out to find the length labelled x to 1 decimal place.

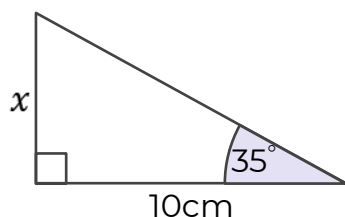


Diagram 1: A right-angled triangle with a vertical side of length x , a horizontal base of length 10cm, and an angle of 35° at the bottom right vertex.

$$\tan(\theta) = \frac{\text{opp}}{\text{adj}}$$

$$\tan(\quad) = \frac{x}{\quad}$$

$$\quad \times \tan(\quad) = x$$

$$\quad = x$$

2. Complete the working out to find the length labelled x to 1 decimal place.

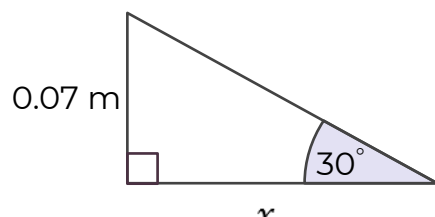


Diagram 2: A right-angled triangle with a vertical side of length 0.07 m, a horizontal base of length x , and an angle of 30° at the bottom right vertex.

$$\tan(\theta) = \frac{\text{opp}}{\text{adj}}$$

$$\tan(30) = \frac{\quad}{\quad}$$

$$\quad \times \tan(30) = \quad$$

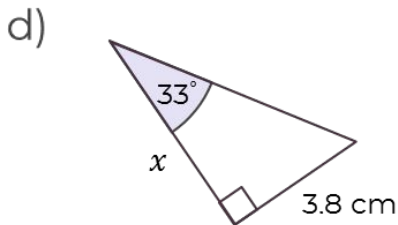
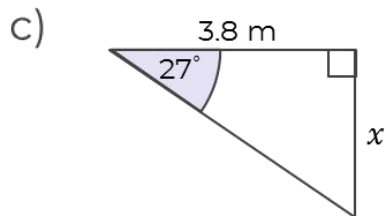
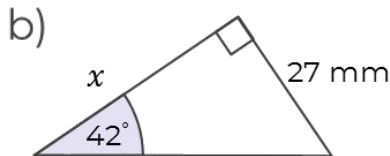
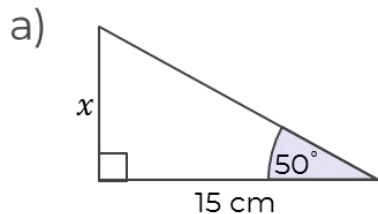
$$\frac{\quad}{\tan(30)} = x$$

$$\quad = x$$

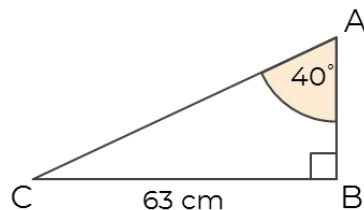


Use Tangent to Find a Length

3. Find the lengths labelled x .
Give your answers correct to 3 significant figures.



4. Lycia is finding the length AB.



$$\begin{aligned}\tan(40) &= \frac{63}{AB} \\ 63 \times \tan(40) &= AB \\ 52.9\text{ cm} &= AB\end{aligned}$$

What mistake has she made?

5. A ladder is placed against a wall.
The base is 3 m from the bottom of the wall, at an angle of 60° with the floor.
How high up the wall does the ladder reach?



Answers



Use Tangent to Find a Length

1. Complete the working out to find the length labelled x to 1 decimal place.

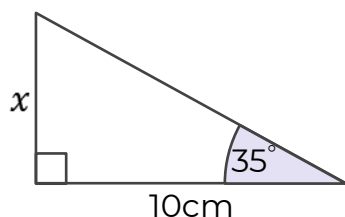


Diagram of a right-angled triangle. The vertical side is labeled x , the horizontal side is labeled 10cm, and the angle at the bottom right is 35° .

$$\tan(\theta) = \frac{\text{opp}}{\text{adj}}$$
$$\tan(35) = \frac{x}{10}$$
$$10 \times \tan(35) = x$$
$$7 \text{ cm} = x$$

2. Complete the working out to find the length labelled x to 1 decimal place.

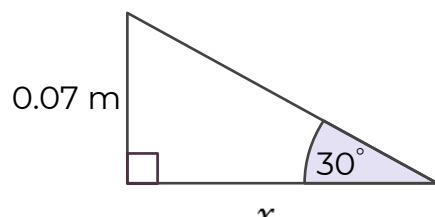
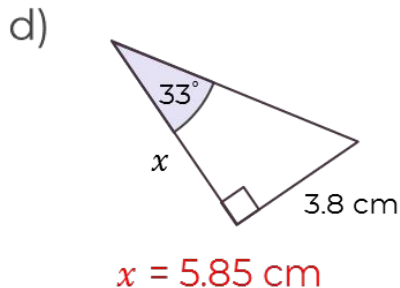
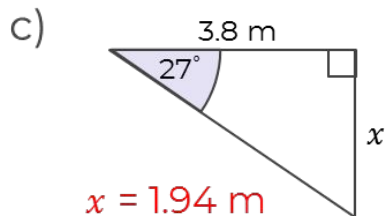
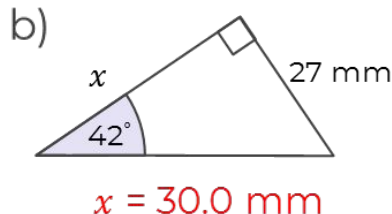
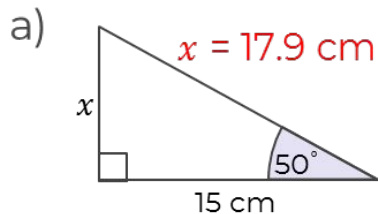


Diagram of a right-angled triangle. The vertical side is labeled 0.07 m, the horizontal side is labeled x , and the angle at the bottom right is 30° .

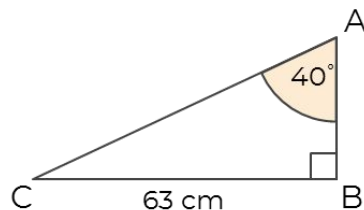
$$\tan(\theta) = \frac{\text{opp}}{\text{adj}}$$
$$\tan(30) = \frac{0.07}{x}$$
$$x \times \tan(30) = 0.07$$
$$\frac{0.07}{\tan(30)} = x$$
$$0.12 \text{ m} = x$$


Use Tangent to Find a Length

3. Find the lengths labelled x .
Give your answers correct to 3 significant figures.



4. Lycia is finding the length AB.



$$\begin{aligned}\tan(40) &= \frac{63}{AB} \\ 63 \times \tan(40) &= AB \\ 52.9 \text{ cm} &= AB\end{aligned}$$

What mistake has she made?

She has multiplied by 63. She should have multiplied by AB, then divide by $\tan(40)$.

5. A ladder is placed against a wall.

The base is 3 m from the bottom of the wall, at an angle of 60° with the floor.
How high up the wall does the ladder reach? 5.2 m

