

Trigonometry #4

Draw diagrams, or label the diagrams given, for these problems. Write all answers to 2 decimal places. REMEMBER TO INCLUDE UNITS IN YOUR ANSWER.

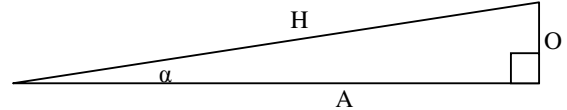
1. Look at the triangle on the right. Use the following words to describe the phrases below. Some words may be used more than once.

Rise, Run, Gradient

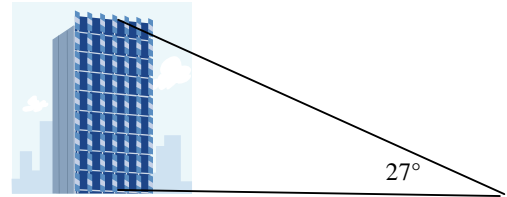
a) Opposite _____

b) Slope _____

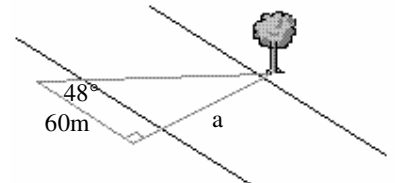
c) Adjacent _____ d) $\tan \alpha$ _____ e) Horizontal _____



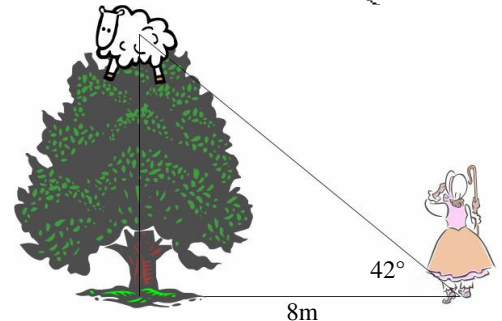
2. A surveyor stands with his theodolite, 85m from a building. He measures that the angle from the top of the building to the horizontal is 27° . How tall is the building? (Start with a diagram)



3. Some engineers want to build a bridge across a wide river. First, they want to know how wide the river is. They use a theodolite directly opposite a tree, to get the compass bearing, then move 60m up river and sight the tree again. They measure the angle difference between the two sightings and record it as 48° . How far is it across the river?



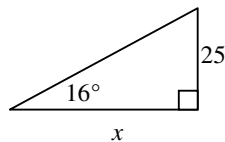
4. Miss Bo-Peep is standing 8 metres from the tree, and sees her sheep about to jump down (about to become a woollen jumper). If the angle of elevation is 42 degrees from Bo-Peep to the sheep, how high up is it to the sheep?



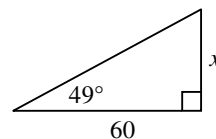
FOR QUESTIONS 2 – 4: Have you included units in the answer? Are your answers to 2 decimal places?

5. Find the value of x in the following. Make sure you write the formula first, with x as the subject, then calculate your answer to 2 decimal places.

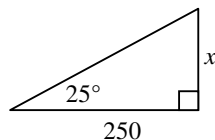
a)



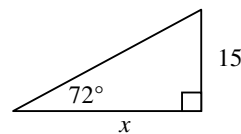
b)



c)



d)



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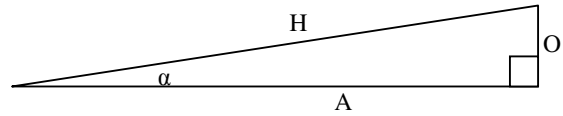
1. Look at the triangle on the right. Use the following words to describe the phrases below. Some words may be used more than once.

Rise, Run, Gradient

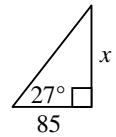
a) Opposite Rise _____

b) Slope Gradient _____

c) Adjacent Run _____ d) Tana Gradient _____ e) Horizontal Run _____

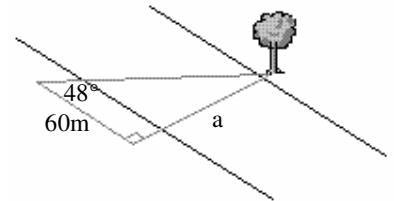


2. A surveyor stands with his theodolite, 85m from a building. He measures that the angle from the top of the building to the horizontal is 27° . How tall is the building? (Start with a diagram)
The height of the building is x ; $\tan 27^\circ = x/85$; $x = 85 \tan 27^\circ = \underline{43\text{m}}$



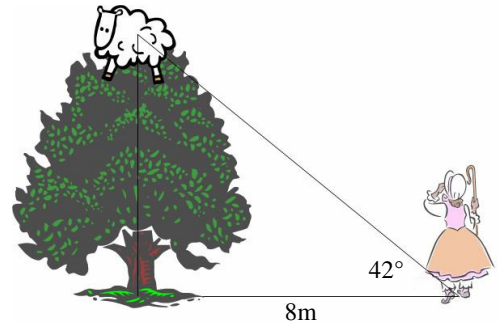
3. Some engineers want to build a bridge across a wide river. First, they want to know how wide the river is. They use a theodolite directly opposite a tree, to get the compass bearing, then move 60m up river and sight the tree again. They measure the angle difference between the two sightings and record it as 48° . How far is it across the river?

The distance across the river is a . $\tan 48^\circ = a/60$; $a = 60 \tan 48^\circ = \underline{66.64\text{m}}$



4. Miss Bo-Peep is standing 8 metres from the tree, and sees her sheep about to jump down (about to become a woollen jumper). If the angle of elevation is 42 degrees from Bo-Peep to the sheep, how high up is it to the sheep?

The height is h . $\tan 42^\circ = h/8$; $x = 8 \times \tan 42^\circ = \underline{7.20\text{m}}$



**FOR QUESTIONS 2 – 4: Have you included units in the answer?
Are your answers to 2 decimal places?**

5. Find the value of x in the following. Make sure you write the formula first, with x as the subject, then calculate your answer to 2 decimal places.

a)

$$\tan 16^\circ = 25/x$$

$$x = 25 / \tan 16^\circ$$

$$x = \underline{87.19}$$

b)

$$\tan 49^\circ = x/60$$

$$x = 60 \tan 49^\circ$$

$$x = \underline{69.02}$$

c)

$$\tan 25^\circ = x/250$$

$$x = 250 \tan 25^\circ$$

$$x = \underline{116.58}$$

d)

$$\tan 72^\circ = 15/x$$

$$x = 15 / \tan 72^\circ$$

$$x = \underline{4.87}$$