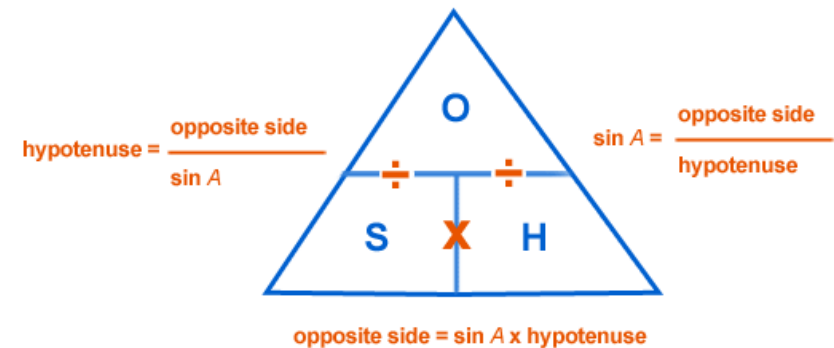
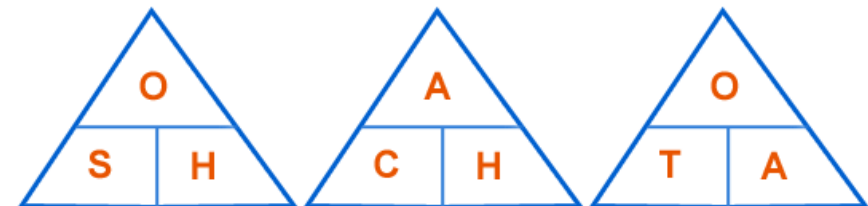
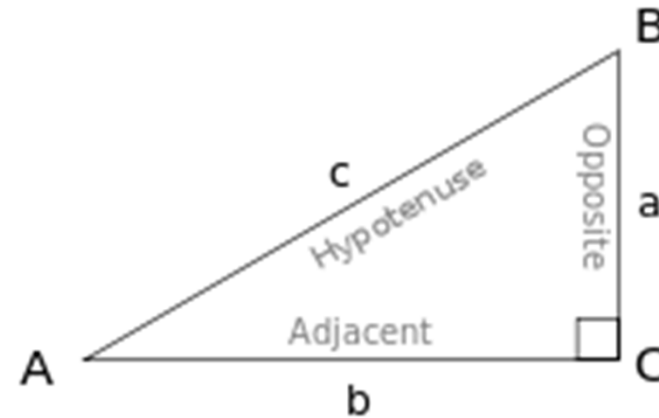
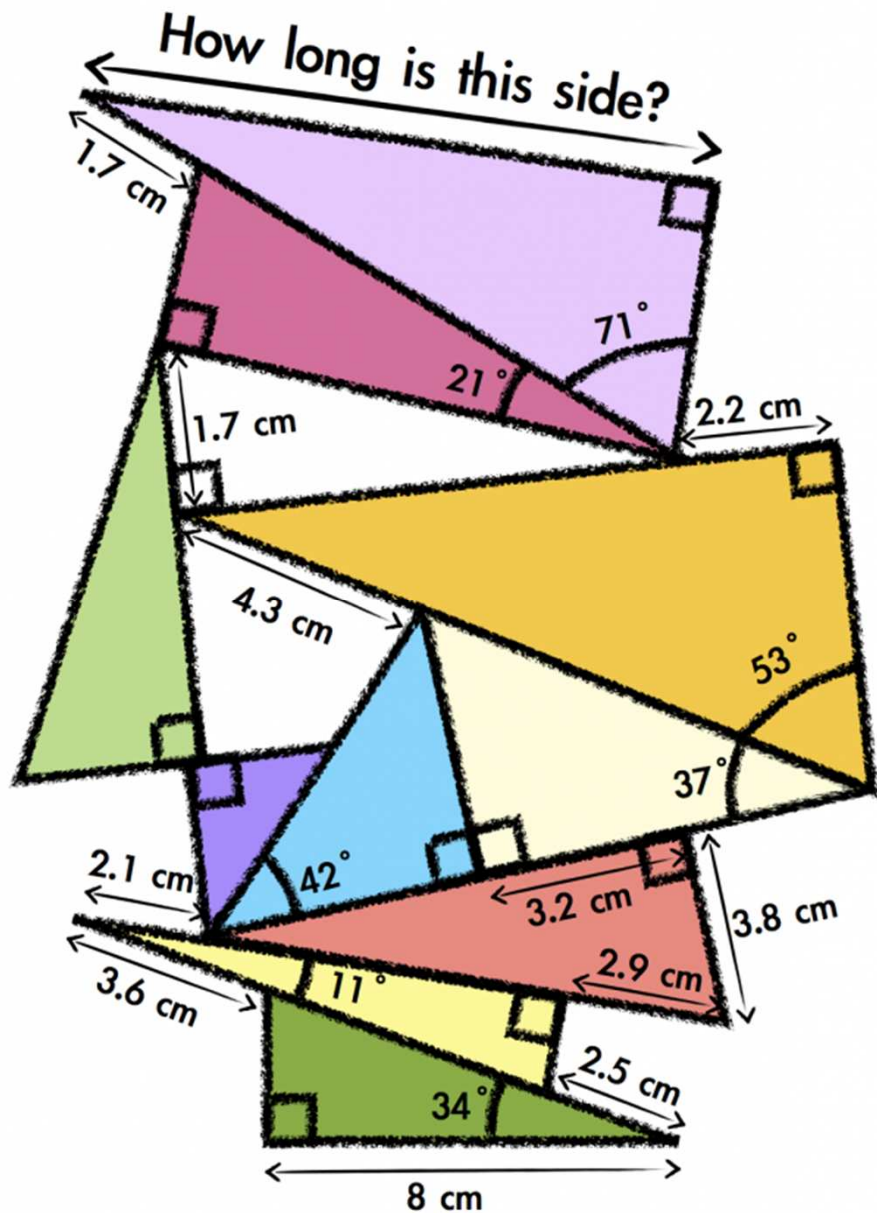
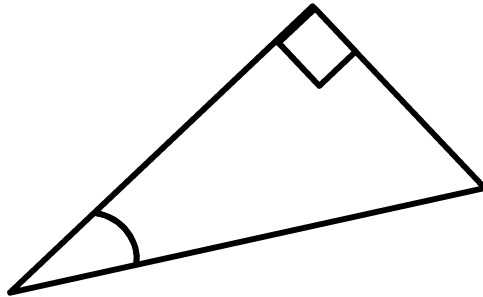


Trigonometry (right-angled triangles)



Choosing the right ratio

We have 3 different trig ratios that are used when comparing sides in a right angled triangle



$\sin =$ _____ $\cos =$ _____

$\tan =$ _____

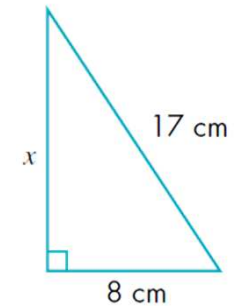
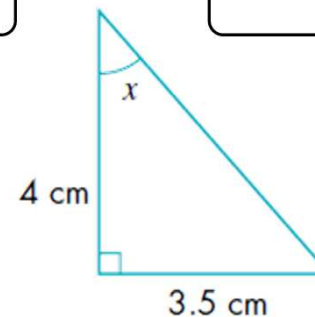
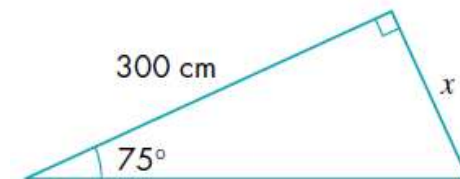
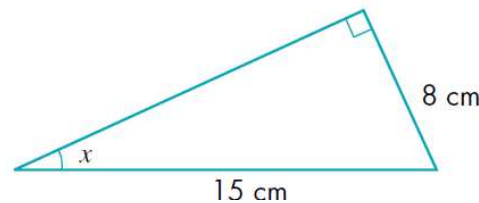
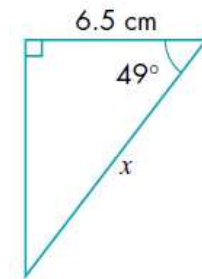
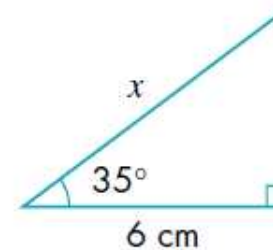
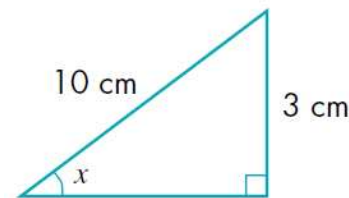
S

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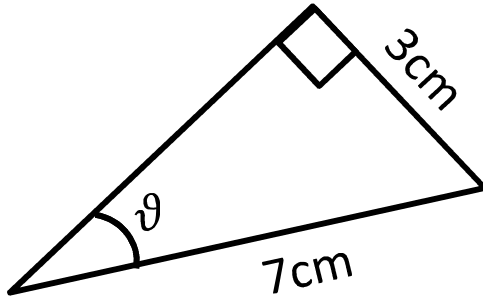
All right-angled trig questions need 3 pieces of information: **2 sides and 1 angle**. One piece of info will be unknown.

Which trig ratio will we use when answering each of these questions



Finding missing angles

e.g.



The example includes the (o) and (h) sides, so we need to use sin

The formula tells us:

$$\sin(\theta) = \frac{\text{opposite}}{\text{hypotenuse}}$$

To find the size of the angle we must use the *inverse sine* (\sin^{-1}) function on our calculator

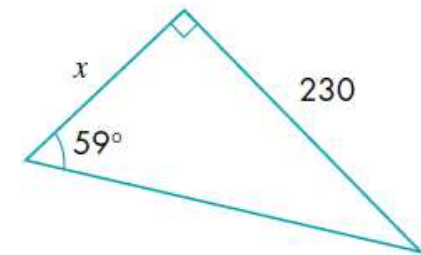
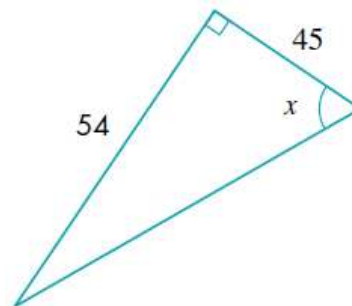
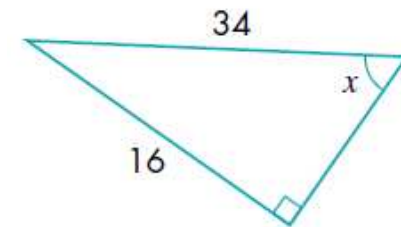
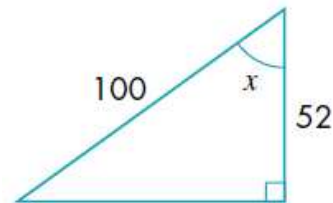
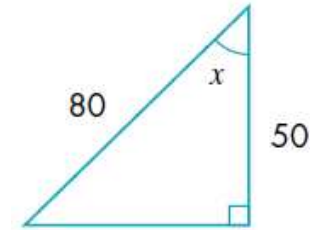
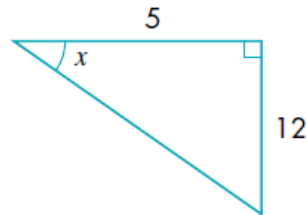
$$\theta = \sin^{-1}\left(\frac{\text{opposite}}{\text{hypotenuse}}\right)$$



The button is found above the sin button

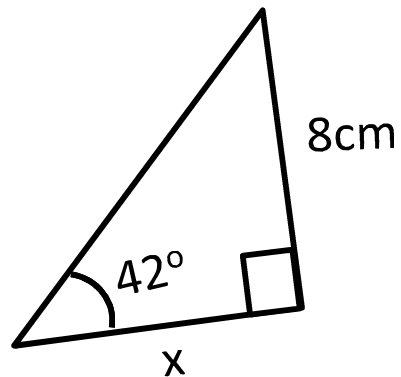
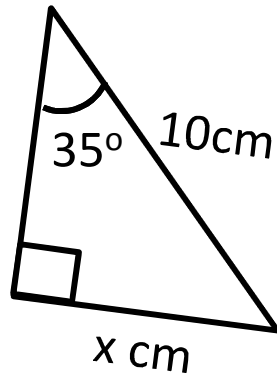


Find the missing angles. Give your answers to **3 significant figures**

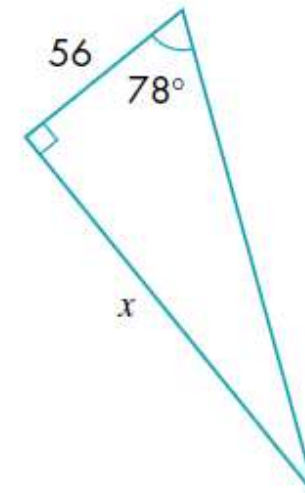
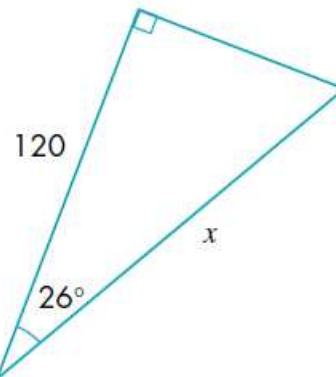
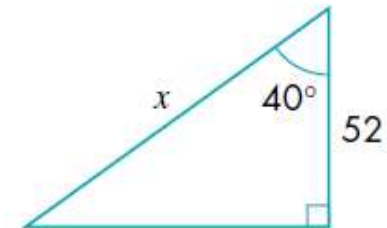
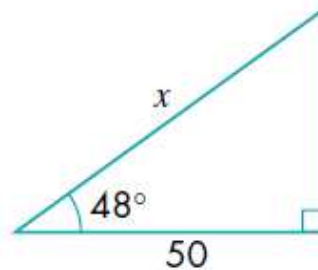
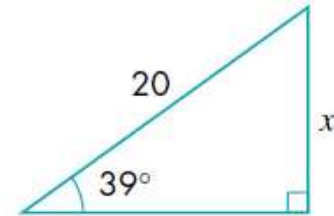
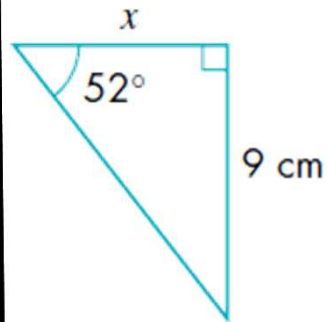


Finding missing sides

If one of the sides is unknown, we have to rearrange our equation

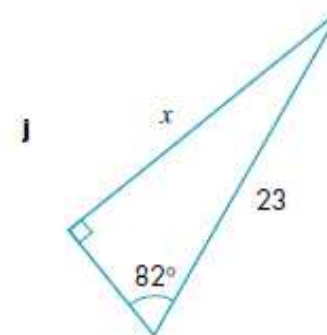
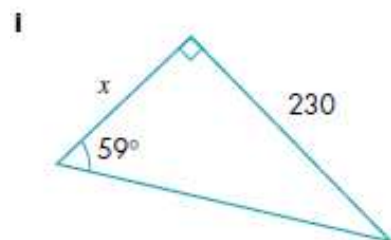
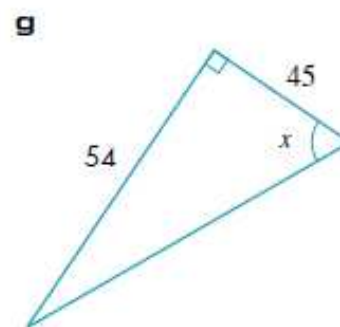
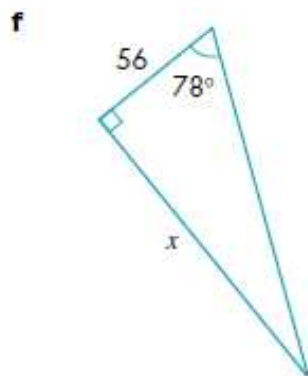
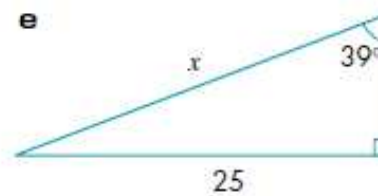
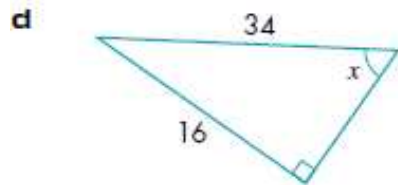
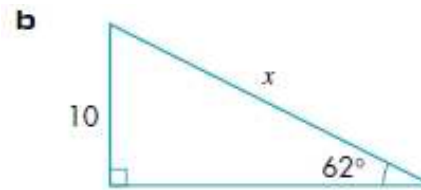
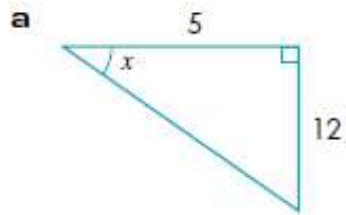


Find the missing lengths or angles. Give your answers to **3 significant figures**.



Mixed Questions

- find the angle or length marked



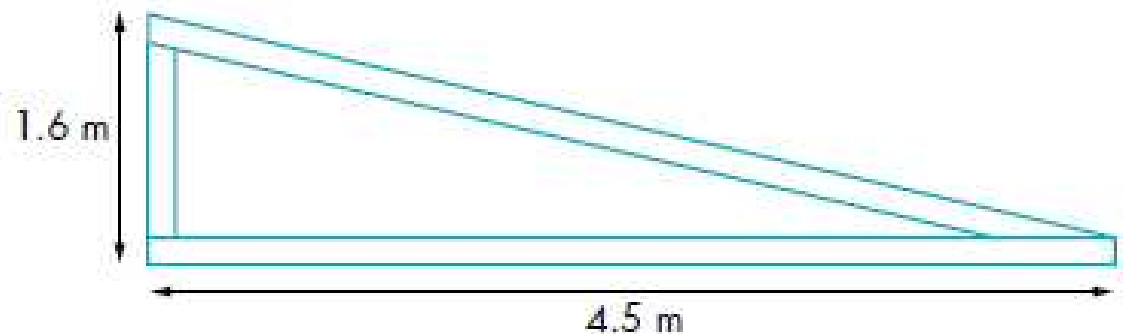
Word Questions

A ladder, 6 m long, rests against a wall. The foot of the ladder is 2.5 m from the base of the wall. What angle does the ladder make with the ground?

The ladder in question 1 has a “safe angle” with the ground of between 60° and 70° . What are the safe limits for the distance of the foot of the ladder from the wall?

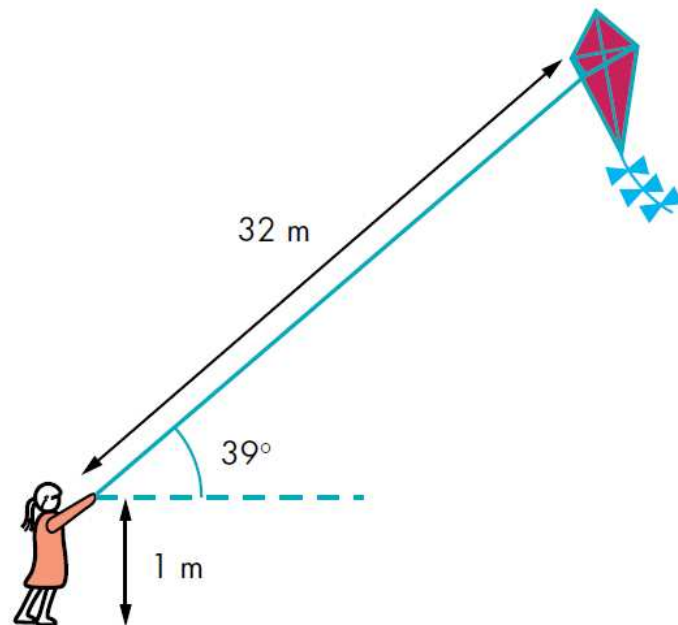
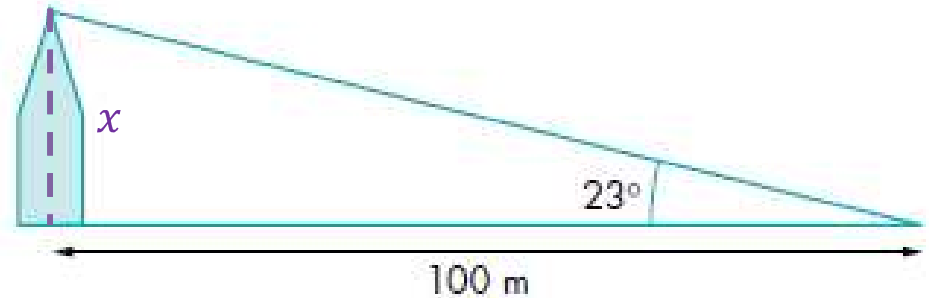
This diagram shows a roof truss.

- a** What angle will the roof make with the horizontal?
- b** Use Pythagoras' theorem to calculate the length of the sloping strut.



Word Questions

Alicia paces out 100 m from the base of a church. She then measures the angle to the top of the spire as 23° . How high is the church spire?



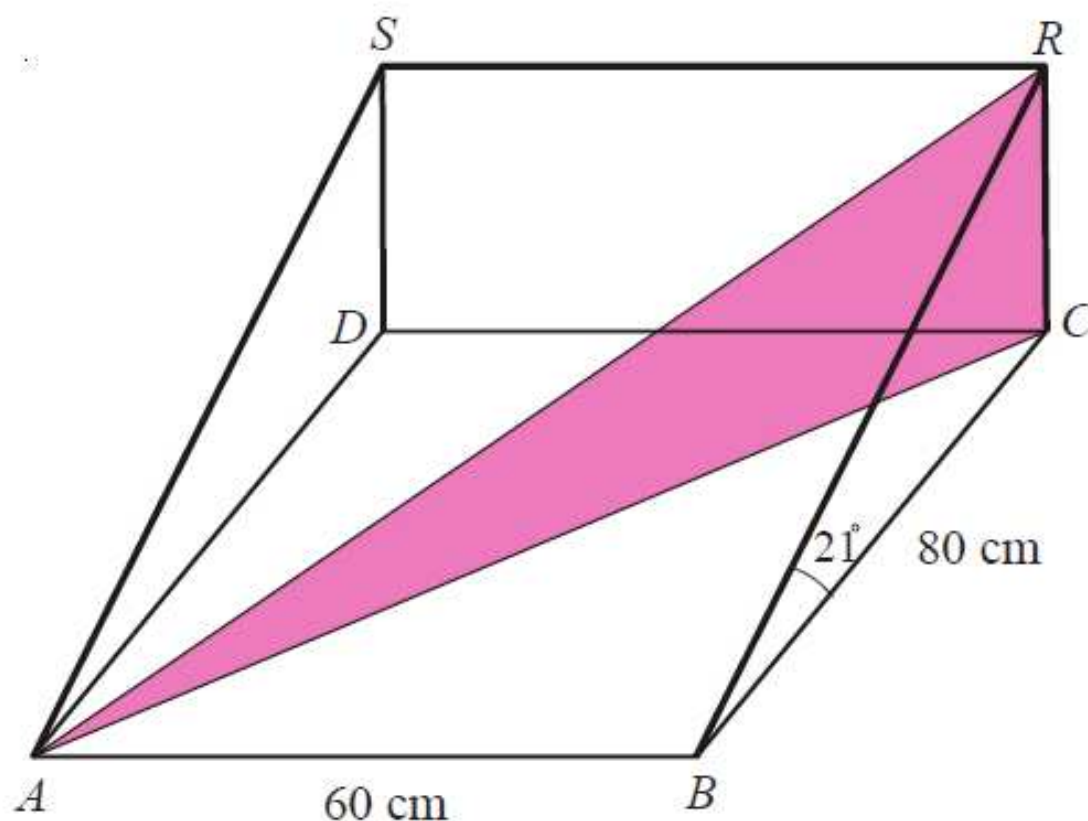
A girl is flying a kite on a string 32 m long. The string, which is being held at 1 m above the ground, makes an angle of 39° with the horizontal. How high is the kite above the ground?

Extension

The diagram shows a wedge.

The base of the wedge is a horizontal rectangle measuring 80 cm by 60 cm.

The sloping face $ABRS$ makes an angle of 21° to the horizontal.



Calculate the angle that AR makes with the horizontal plane $ABCD$.

Give your answer correct to 1 decimal place.