

# Sine Rule: Finding a Side *stretch*

ANSWERS 

1



In triangle  $KLM$ , angle  $K = 47^\circ$ , angle  $L = 68^\circ$  and  $KM = 9.3$  cm.

Find  $LM$  to 3 significant figures.

$$\frac{LM}{\sin 47^\circ} = \frac{9.3}{\sin 68^\circ}$$

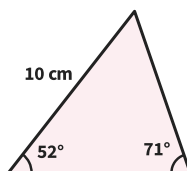
$$LM = 7.34 \text{ cm}$$

Answer

2



Find the length of the shortest side of the triangle, to 3 significant figures.



57° left: shortest is opposite 52°

$$\frac{x}{\sin 52^\circ} = \frac{10}{\sin 71^\circ}$$

$$8.33 \text{ cm}$$

Answer

3

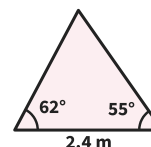


The end of a tent is a triangle.

Its base is 2.4 m wide and its sides

slope at  $62^\circ$  and  $55^\circ$  to the ground.

Find the length of the longer sloping side, to 3 significant figures.



longer side: opposite  $62^\circ$

$$\text{top } 63^\circ, 2.4 \sin 62^\circ \div \sin 63^\circ$$

$$2.38 \text{ m}$$

Answer

4



$$\text{Ali solves } \frac{x}{\sin 40^\circ} = \frac{9}{\sin 70^\circ}$$

He writes

$$x = 9 \times \sin 70^\circ \div \sin 40^\circ = 13.2.$$

Explain his mistake and find  $x$  to 3 significant figures.

multiply both sides by  $\sin 40^\circ$

$$x = 9 \times \sin 40^\circ \div \sin 70^\circ$$

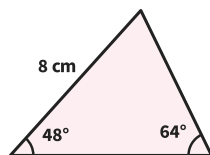
$$x = 6.16$$

Answer

5



Find the area of the triangle, to 3 significant figures.



$$8 \sin 48^\circ \div \sin 64^\circ = 6.615$$

$$\frac{1}{2} \times 8 \times 6.615 \times \sin 68^\circ$$

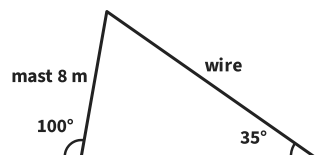
$$24.5 \text{ cm}^2$$

Answer

6



A mast 8 m long leans at  $100^\circ$  to the flat ground. A wire from its top makes  $35^\circ$  with the ground. Find the length of the wire to 3 significant figures.



angles in the triangle:  $80^\circ$ ,  $35^\circ$  and  $65^\circ$

$$\text{wire} = 8 \times \sin 80^\circ \div \sin 35^\circ$$

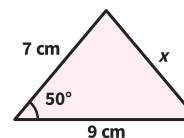
$$13.7 \text{ m}$$

Answer

7



Sam wants to use the sine rule to find  $x$ . Explain why he cannot, and say what he should use instead.



no side is paired with its angle

the  $50^\circ$  is between the two sides

use the cosine rule

Reason

8



The angles of a triangle are in the ratio  $2 : 3 : 4$ . Its shortest side is 5 cm. Find the length of its longest side, to 3 significant figures.

angles  $40^\circ$ ,  $60^\circ$ ,  $80^\circ$

$$\frac{x}{\sin 80^\circ} = \frac{5}{\sin 40^\circ}$$

$$7.66 \text{ cm}$$

Answer