Quick Test - The Sine Rule
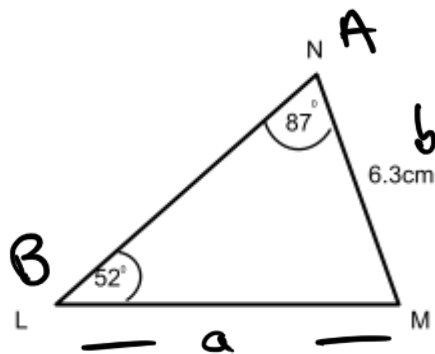
1. Work out the length LM correct to 3 significant figures.   (3 marks)
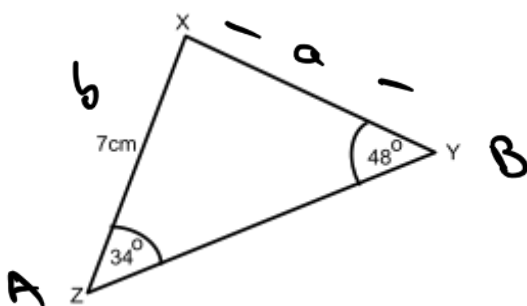

$$\frac{a}{Sin A} = \frac{b}{Sin B}$$

$$\frac{a}{Sin 87°} = \frac{6.3}{Sin 52}$$

$$a = Sin 87 \times \left(\frac{6.3}{Sin 52}\right)$$

$$= 7.9838578\ldots$$

$$= 7.98 cm \quad (3 sf)$$

2. Work out the length XY correct to 3 significant figures.   (3 marks)

$$\frac{a}{Sin A} = \frac{b}{Sin B}$$

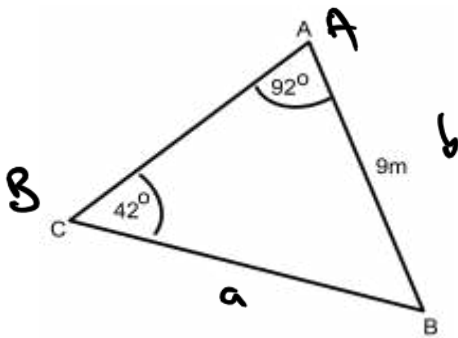$$\frac{a}{Sin 34} = \frac{7}{Sin 48}$$

$$a = Sin 34 \left(\frac{7}{Sin 48}\right)$$

$$= 5.267277$$

$$XY = 5.27 cm$$

Quick Test - The Sine Rule

3. Work out the length BC correct to 1 decimal place. (3 marks)

$$\frac{a}{Sin\,A} = \frac{b}{Sin\,B}$$
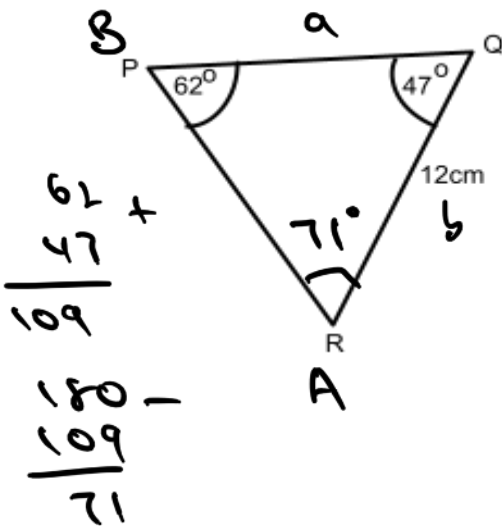
$$\frac{a}{Sin\,92°} = \frac{9}{Sin\,42°}$$

$$a = Sin\,92\left(\frac{9}{Sin\,42}\right)$$

$$= 13.44209$$

$$BC = 13.4m \quad (1dp)$$

4. Work out the length PQ correct to 2 decimal places. (3 marks)

$$\begin{array}{r} 62 \\ 47 \\ \hline 109 \end{array} +$$

$$\begin{array}{r} 180 \\ 109 \\ \hline 71 \end{array} -$$

$$\frac{a}{Sin\,A} = \frac{b}{Sin\,B}$$

$$\frac{a}{Sin\,71} = \frac{12}{Sin\,62}$$

$$a = Sin\,71\left(\frac{12}{Sin\,62}\right)$$

$$= 12.85039$$

$$PQ = 12.85\,cm$$

5. The diagram shows a flagpole held by 2 wire ropes. From point A, the angle of elevation to the top of the flagpole is 65^0. From point B the angle of elevation to the top of the flagpole is 78^0 . The distance from A to B is 7.8m. Find the height of the flagpole. (4 marks)
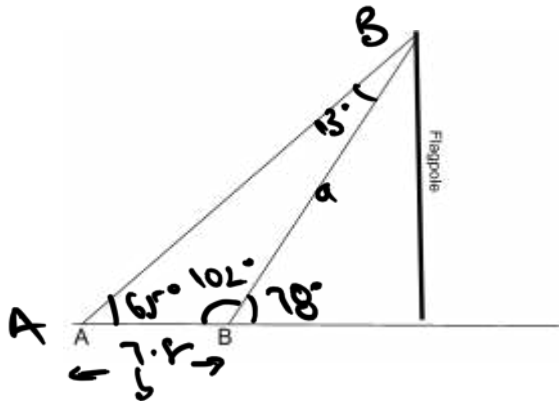
$$\frac{a}{\sin A} = \frac{b}{\sin B}$$
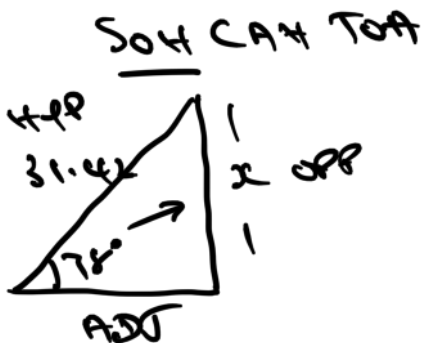
$$\frac{a}{\sin 65^\circ} = \frac{7.8}{\sin 13^\circ}$$

$$a = \sin 65^\circ \left(\frac{7.8}{\sin 13}\right)$$

$$a = 31.4255$$
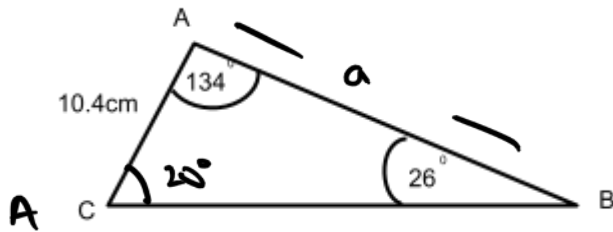
$$\sin 78^\circ = \frac{opp}{31.4255}$$

$$30.738 = opp$$

$$30.74 m = 2 dp$$

SOH CAH TOA

Quick Test - The Sine Rule

6. Work out the area of triangle ABC. Give your answer to a suitable degree of accuracy.

(4 marks)

A

10.4cm

A 134°

a

20°

26°

A C

B

$Area = \frac{1}{2} ab \sin C$

$\frac{a}{\sin A} = \frac{b}{\sin B}$

$Area = \frac{1}{2} ab \sin C$

$= \frac{1}{2} \cdot ANS \cdot 10.4 \cdot \sin 134°$

$= 30.35152$

$= 30.35 cm^2 \ (2dp)$

$\frac{a}{\sin 20} = \frac{10.4}{\sin 26°}$

$a = \sin 20 \left(\frac{10.4}{\sin 26}\right)$

$= 8.114150057$

7. Work out the size of angle ABC. Give your answer correct to 1 decimal place.

(3 marks)

C

a

8 cm

6 cm

37°

A

A

B
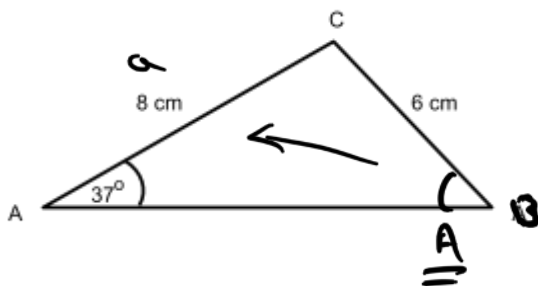
$\frac{\sin A}{a} = \frac{\sin B}{b}$

$\frac{\sin A}{8} = \frac{\sin 37}{6}$

$\sin^{-1} \left(8 \times \left(\frac{\sin 37}{6}\right)\right)$

$= 53.361$

$\angle ABC = 53.4° \ (1dp)$

$\sin A = 8 \times \left(\frac{\sin 37}{6}\right)$

Quick Test - The Sine Rule

8. Work out the size of angle x. Give your answer correct to 3 significant figures..

(3 marks)

$$\frac{\sin A}{a} = \frac{\sin B}{b}$$

$$\frac{\sin A}{14} = \frac{\sin 47}{17}$$

$$\sin^{-1}\left(14 \times \left(\frac{\sin 47}{17}\right)\right)$$

$$37 \cdot 034125 = x = 37 \cdot 0°$$

(3 dp)
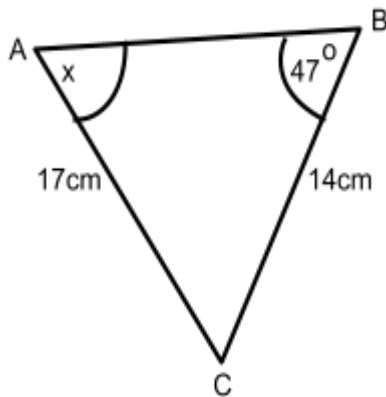
9. Work out the size of angle x. Give your answer correct to 3 significant figures.

(3 marks)

$$\frac{\sin A}{a} = \frac{\sin B}{b}$$
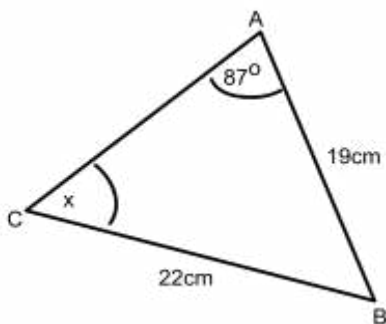
$$\frac{\sin x}{19} = \frac{\sin 87}{22}$$

$$\sin^{-1}\left(19 \times \left(\frac{\sin 87}{22}\right)\right)$$

$$59 \cdot 5931 \qquad \therefore \angle x = 59 \cdot 6°$$

Quick Test - The Sine Rule
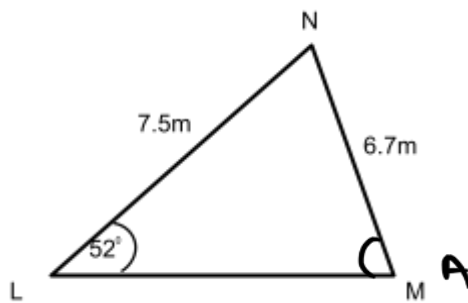
10. Work out angle LMN correct to 3 significant figures.   (3 marks)

N

7.5m

6.7m

52°

L   M A
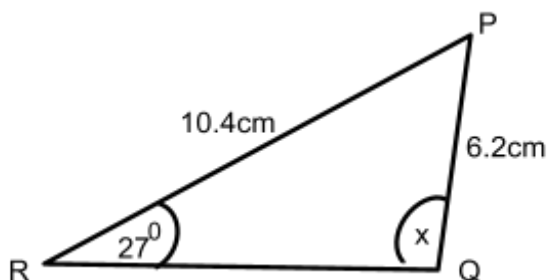
$$\frac{\sin A}{a} = \frac{\sin B}{b}$$

$$\frac{\sin A}{7.5} = \frac{\sin 52°}{6.7}$$

$$\sin^{-1} \left(7.5 \times \left(\frac{\sin 52}{6.7} \right) \right)$$

61.8969 $\angle LMN = 61.9°$

11. Angle PQR is obtuse. Work out the size of angle PQR. Give your answer to 1 decimal place.   (4 marks)

P

10.4cm

6.2cm

27°   x

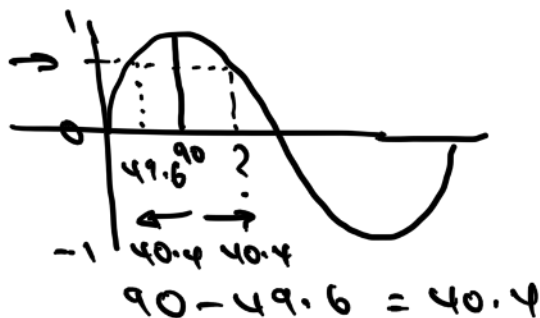R   Q

$$\frac{\sin A}{a} = \frac{\sin B}{b}$$

$$\frac{\sin A}{10.4} = \frac{\sin 27}{6.2}$$

$$\sin^{-1} \left(10.4 \times \left(\frac{\sin 27}{6.2} \right) \right)$$

49.599° $= 49.6°$ (acute)

90 − 49.6 = 40.4

So obtuse angle = 90 + 40.4

$= 130.4°$

41.6° ?

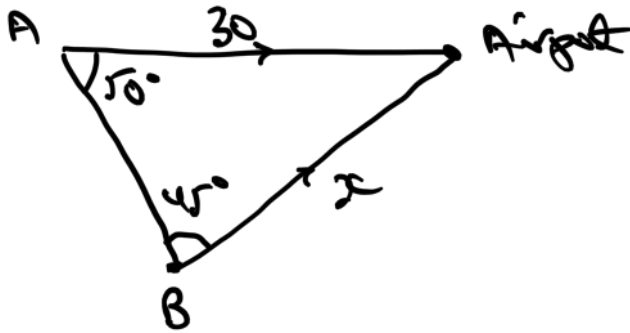40.4 40.4

Quick Test - The Sine Rule

12. Airplane A is flying directly towards an airport which is 30 miles away. The pilot of airplane A sees airplane B, which is 50^0 on his right.
Airplane B is also flying directly to the airport.
The pilot of airplane B calculates that airplane A is 45^0 on her left.
How far is airplane B from the airport?   (4 marks)

A 30 Airport

$\frac{x}{\sin 50} = \frac{30}{\sin 45^0}$

$x = \sin 50 \times \left(\frac{30}{\sin 45}\right)$

$= 32.50051323$ miles

$= 32.5$ miles (1dp)

Quick Test - The Sine Rule

13. Sean and Rohan are standing 400m on a straight, horizontal road. They see a hot air balloon between them directly above the road. The angle of elevation from Sean is 62^0 and from Rohan is 78^0.
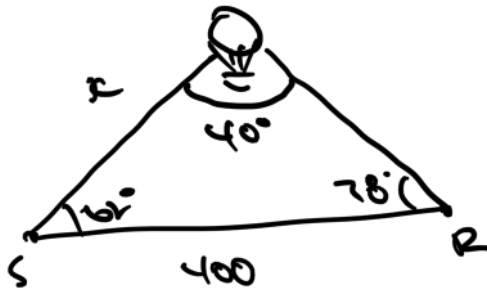
(a) Work out the distance between Sean and the balloon   (2 marks)

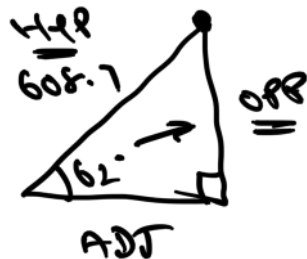(b) Find the height of the balloon directly above the road.   (2 marks)

Give your answers correct to 1 decimal place.

$$\frac{x}{\sin 78°} = \frac{400}{\sin 40°}$$

$$x = \sin 78 \times \left(\frac{400}{\sin 40}\right)$$

(a) $= 608.7m$ (1dp)

SOH CAH TOA

$$\sin 62° = \frac{OPP}{608.7} \leftarrow (ANS)$$

$$\sin 62 \times 608.7 = OPP$$

$$537.44 = OPP$$

Height $= 537.4m$ (1dp)

Total   / 44 marks