

Further Trigonometry

ANSWERS

Calculator | 30 minutes | Total marks: 31

Name

Class

1 Write down the exact value of

(a) $\cos 60^\circ$

Answer $\frac{1}{2}$ (1) [1 mark]

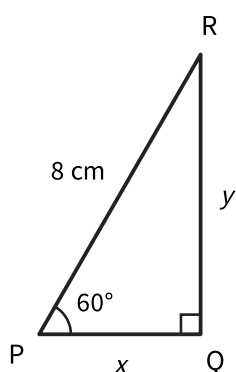
(b) $\tan 45^\circ$

Answer 1 (1) [1 mark]

(c) $\sin 45^\circ$

Answer $\frac{1}{\sqrt{2}}$ or $\frac{\sqrt{2}}{2}$ (1) [1 mark]

2 The diagram shows a right angled triangle.



Not drawn accurately

(a) Use $\cos 60^\circ$ to work out the length x .

Answer 4 (1) cm [1 mark]

(b) Work out the length y .

Give your answer as an exact value.

$$8 \times \sin 60^\circ = 8 \times \frac{\sqrt{3}}{2} \quad (1)$$

Answer $4\sqrt{3}$ (1) [2 marks]

3 Write down whether you would use the sine rule or the cosine rule to find x .

(a) You know two angles and one side of a triangle. x is another side.

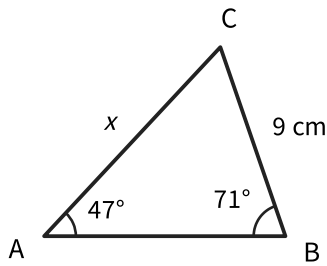
Answer sine rule (1) [1 mark]

(b) You know two sides of a triangle and the angle between them. x is the third side.

Answer cosine rule (1) [1 mark]

4

In triangle ABC, angle A = 47° , angle B = 71° and BC = 9 cm.



Not drawn accurately

Work out the length x.

Give your answer to 1 decimal place.

$$\frac{x}{\sin 71^\circ} = \frac{9}{\sin 47^\circ} \quad (1)$$

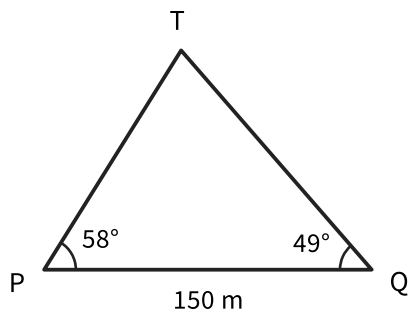
$$x = \frac{9 \times \sin 71^\circ}{\sin 47^\circ} \quad (1)$$

Answer 11.6 (1) cm [3 marks]

5

P and Q are two points 150 m apart on one bank of a straight river.

T is a tree on the other bank. Angle TPQ = 58° and angle TQP = 49° .



Not drawn accurately

Work out the distance PT.

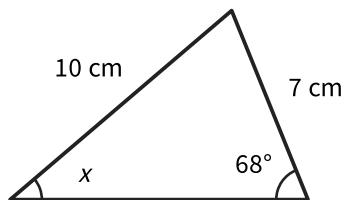
Give your answer to 1 decimal place.

$$\text{angle } PTQ = 180^\circ - 58^\circ - 49^\circ = 73^\circ \quad (1)$$

$$PT = \frac{150 \times \sin 49^\circ}{\sin 73^\circ} \quad (1)$$

Answer 118.4 (1) m [3 marks]

6



Not drawn accurately

Work out the size of angle x.

Give your answer to 1 decimal place.

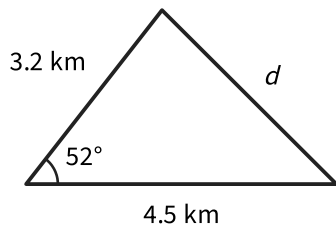
$$\frac{\sin x}{7} = \frac{\sin 68^\circ}{10} \quad (1)$$

$$\sin x = \frac{7 \times \sin 68^\circ}{10} = 0.6490... \quad (1)$$

Answer 40.5 (1) ° [3 marks]

- 7 Ana and Ben walk away from a car park in straight lines.

Ana walks 3.2 km and Ben walks 4.5 km. The angle between their paths is 52° .



Not drawn accurately

Work out the distance d between Ana and Ben.

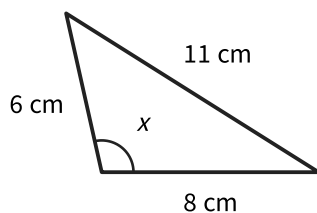
Give your answer to 1 decimal place.

$$d^2 = 3.2^2 + 4.5^2 - 2 \times 3.2 \times 4.5 \times \cos 52^\circ \quad (1)$$

$$d^2 = 12.76... \quad (1)$$

Answer 3.6 (1) km [3 marks]

- 8 A triangle has sides of 8 cm, 6 cm and 11 cm.



Not drawn accurately

Work out the size of its largest angle, x .

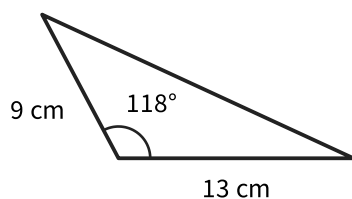
Give your answer to 1 decimal place.

$$\cos x = \frac{8^2 + 6^2 - 11^2}{2 \times 8 \times 6} \quad (1)$$

$$\cos x = \frac{-21}{96} = -0.21875 \quad (1)$$

Answer 102.6 (1) ° [3 marks]

- 9



Not drawn accurately

- (a) Work out the area of the triangle.

Give your answer to 1 decimal place.

$$\frac{1}{2} \times 9 \times 13 \times \sin 118^\circ \quad (1)$$

Answer 51.7 (1) cm² [2 marks]

- (b) A different triangle has an area of 40 cm² and two sides of 10 cm and 12 cm.

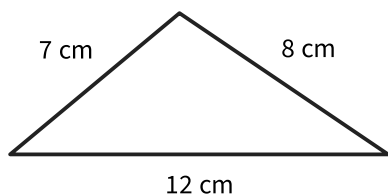
Work out the acute angle between these two sides. Give your answer to 1 decimal place.

$$\frac{1}{2} \times 10 \times 12 \times \sin C = 40, \text{ so } \sin C = \frac{2}{3} \quad (1)$$

Answer 41.8 (1) ° [2 marks]

10

A triangle has sides of 7 cm, 8 cm and 12 cm.



Not drawn accurately

Work out the area of the triangle.

Give your answer to 1 decimal place.

$$\cos C = \frac{7^2 + 8^2 - 12^2}{2 \times 7 \times 8} \quad (1)$$

$$C = 106.1^\circ \quad (1)$$

$$\frac{1}{2} \times 7 \times 8 \times \sin 106.1^\circ \quad (1)$$

Answer 26.9 (1) cm² [4 marks]

Question	Topic	RAG
1	I know the exact values of sin, cos and tan	
2	I can use exact values to find a side	
3	I can choose the sine rule or the cosine rule	
4	I can use the sine rule to find a side	
5	I can find the third angle, then use the sine rule	
6	I can use the sine rule to find an angle	
7	I can use the cosine rule to find a side	
8	I can use the cosine rule to find an angle	
9	I can use area = $\frac{1}{2}ab \sin C$, forwards and backwards	
10	I can find the area of a triangle from its three sides	