

Lesson 4

GCSE Mathematics Non-Right Angled Trigonometry

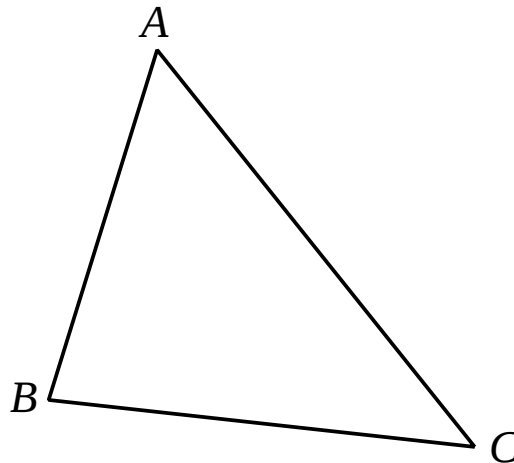
4.1 The Cosine Rule

This is Pythagoras' Theorem for triangles without a right angle.

Used when two sides and the included angle are known and the third side sought.

4.2 Introductory Question

- (i) On $\triangle ABC$, place the letters a , b and c .



- (ii) On $\triangle ABC$, mark on that;

- AC is of length 6.3cm.
- AB is of length 7.8cm.
- $\angle A$ is 70° .
- BC is the length x , which is to be found.

- (iii) Mark on the *included* angle with a *.

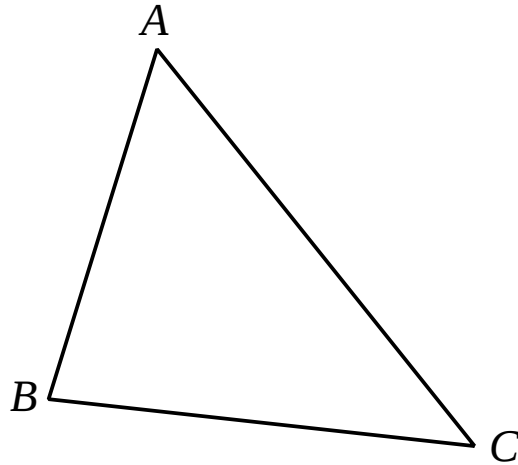
- (iv) Use the cosine rule to find the length of x correct to three significant figures.

- (v) Find the area of $\triangle ABC$, correct to three significant figures.

4.3 Exercise

Question 1

- (i) On $\triangle ABC$, place the letters a , b and c .



- (ii) On $\triangle ABC$, mark on that;

- AC is of length 8cm.
- AB is of length 3cm.
- $\angle A$ is 60° .
- BC is the length x , which is to be found.

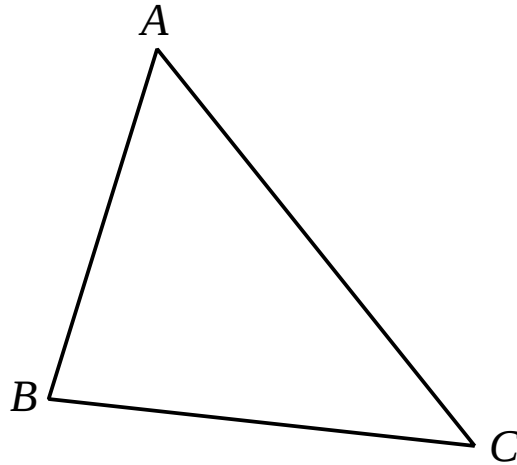
- (iii) Mark on the *included* angle with a *.

- (iv) Use the cosine rule to find the length of x .

- (v) Find the area of $\triangle ABC$.

Question 2

- (i) On $\triangle ABC$, place the letters a , b and c .



- (ii) On $\triangle ABC$, mark on that;

- AC is of length 17 cm.
- AB is of length 15 cm.
- $\angle A$ is 70° .
- BC is the length x , which is to be found.

- (iii) Mark on the *included* angle with a *.

- (iv) Use the cosine rule to find the length of x .

- (v) Find the area of $\triangle ABC$.

Question 3

$\triangle ABC$ has $AB = 5$ cm, $AC = 2$ cm, and $\angle A = 78.5^\circ$.

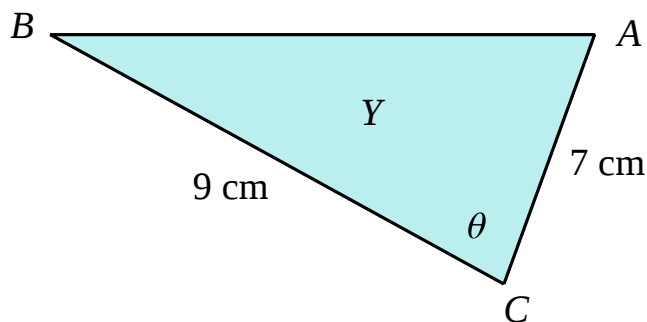
- (i) Sketch, roughly, $\triangle ABC$ and mark on the known lengths and angle.
- (ii) Find the length of side BC .
- (iii) Find the area of $\triangle ABC$.

Question 4

$\triangle ABC$ has $AB = 6$ cm, $AC = 7$ cm, and $\angle A = 125^\circ$.

- (i) Sketch, roughly, $\triangle ABC$ and mark on the known lengths and angle.
- (ii) Find the length of side BC .
- (iii) Find the area of $\triangle ABC$.

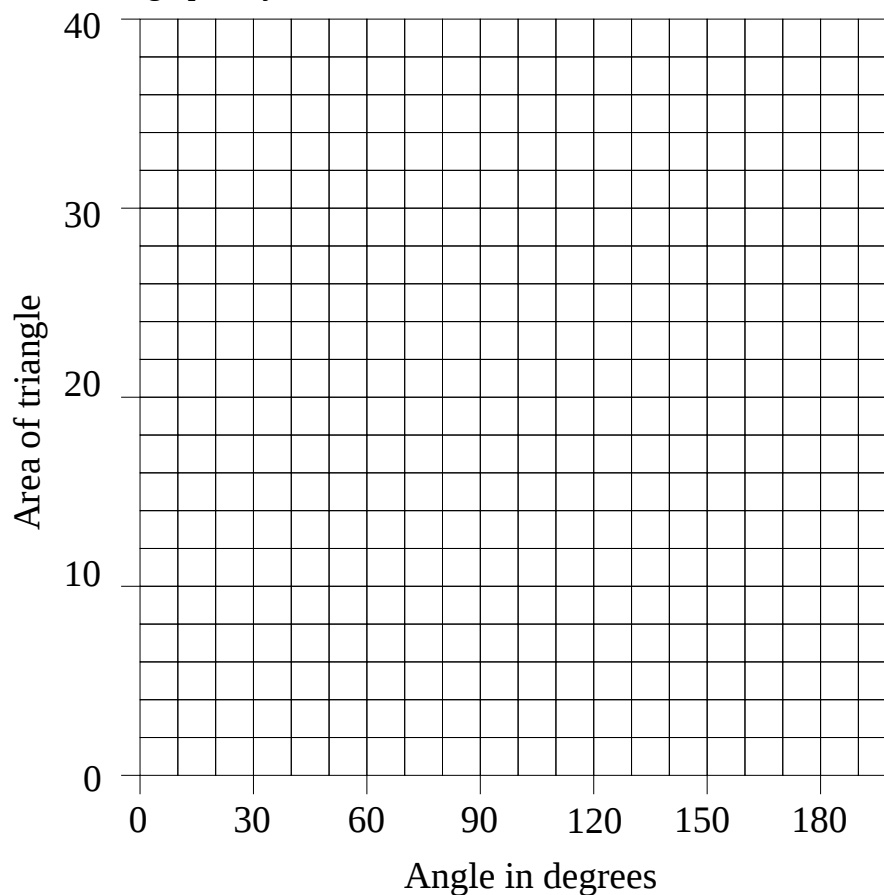
Question 5



(i) Work out the area Y for the values of θ given in the table below;

θ	0°	10°	20°	30°	40°	50°	60°	70°	80°	90°
Y										

(ii) Plot a graph of your results with θ in the x-axis and area Y on the y-axis



(iii) What happens as θ continues to increase beyond 90° and up to 180° ?

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Teachers may obtain detailed worked solutions to the exercises by email from MHHShrewsbury@Gmail.com