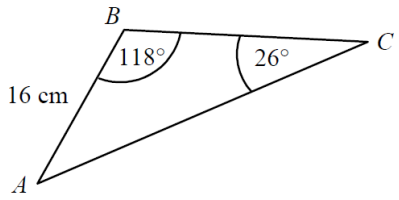
Trignometry

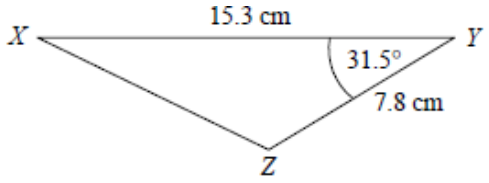
Sine and Cosine Rule

AS-Level	A-Level
Sine and Cosine Rule	Small Angle Approximations Solving Trigonometry Equations Trignometric Proof

1. The diagram shows triangle *ABC* in which *AB* = 16 cm, ∠*ABC* = 118° and ∠*ACB* = 26°. Find the length *AC* to 3 significant figures. **(2)**

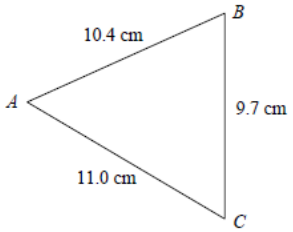


2. The diagram shows triangle *XYZ* in which *XY* = 15.3 cm, *YZ* = 7.8 cm and ∠*XYZ* = 31.5°. Find the length *XZ* to 2 significant figures. **(2)**

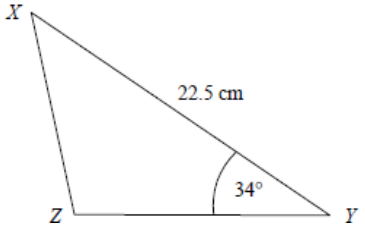


3. Joanne walks 4.2 miles on a bearing of 138°. She then walks 7.8 miles on a bearing of 251°.
a. Calculate how far Joanne is from the point where she started. **(2)**
b. Find, as a bearing, the direction in which Joanne would have to walk in order to return to the point where she started. **(4)**

4. The diagram shows triangle *ABC* in which *AB* = 10.4 cm, *AC* = 11.0 cm and *BC* = 9.7 cm. Find the area of the triangle to 3 significant figures. **(5)**



5. The diagram shows triangle XYZ in which XY = 22.5 cm and ∠XYZ = 34°. Given that the area of the triangle is 100 cm2, find the length *XZ*. **(4)**



Mark Scheme

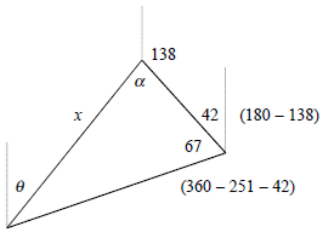
1.

$\frac{AC}{\sin 118} = \frac{16}{\sin 26}$ $AC = \frac{16 \times \sin 118}{\sin 26}$	**M1**
AC = 32.2 cm (to 3 s.f)	**M1**

2.

$XZ^2 = 7.8^2 + 15.3^2 - (2 \times 7.8 \times 15.3 \times \cos 31.5)$ $= 91.422$	**M1**
XZ = 9.56 cm (to 3 s.f)	**M1**

3a.

	
$x^2 = 4.2^2 + 7.8^2 - (2 \times 4.2 \times 7.8 \times \cos 67)$ $x^2 = 52.879$	**M1**
x = 52.879	**M1**

3b.

$\frac{\sin \propto}{7.8} = \frac{\sin 67}{7.2718}$	**M1**
$\sin \propto = \frac{7.8 \times \sin 67}{7.2718} = 0.9874$	**M1**
$\propto = 80.882$ $\emptyset = 138 + \propto - 180 = 38.882$	**M1**
Bearing = 039° (nearest degree)	**M1**

4.

$9.7^2 = 10.4^2 + 11.0^2 - (2 \times 10.4 \times 11.0 \times \cos \angle BAC)$	**M1**
$\cos \angle BAC = \frac{10.4^2 + 11^2 - 9.7^2}{2 \times 10.4 \times 11} = 0.5903$	**M1**
$\angle BAC$ = 53.819	**M1**
Area = $\frac{1}{2} \times 10.4 \times 11.0 \times \sin 53.819$	**M1**
Area = 46.2 cm^2	**M1**

5.

Area = 100 = $\frac{1}{2} \times 22.5 \times YZ \times sin34$	**M1**
$YZ = \frac{200}{22.5 \times \sin 34} = 15.896$	**M1**
$XZ^2 = 22.5^2 + 15.896^2 - (2 \times 22.5 \times 15.896 \times \cos 34)$ $XZ^2 = 165.906$	**M1**
XZ = 12.9cm (3 s.f)	**M1**