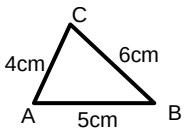
GCSE - Mathematics
Topic: Sine and Cosine rules
- 2D and 3D

Tier: Higher

Grade: A*/ A

Starter. Which rule would you use?

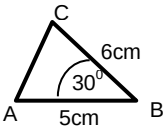


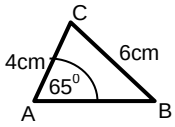
Find Angle ACB

Rule ……

Find length AC

Rule ……

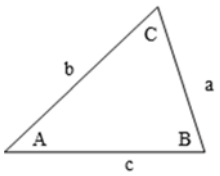




Find Angle ABC

Rule ……

Top Tips!



SINE RULE
To use the sine rule you must have **an angle and opposite side**

Use to find **side**

$$\frac{a}{SinA} = \frac{b}{SinB} = \frac{c}{SinC}$$

Use to find **angle**

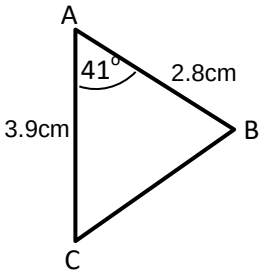
$$\frac{SinA}{a} = \frac{SinB}{b} = \frac{SinC}{c}$$

COSINE RULE
Use with questions were **Two sides** and the **angle** between them *or* **all three sides** is known

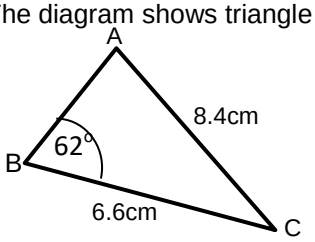
$$a^2 = b^2 + c^2 - 2bc\cos A$$

Skills:

Calculate the length of side B*C*



The diagram shows triangle *ABC*.

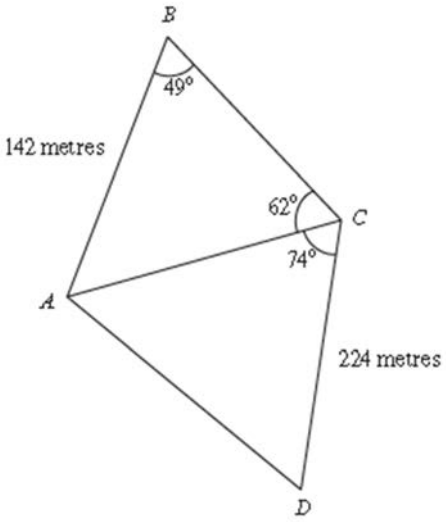


Calculate the size of the acute angle *BAC*

Examination Question:

2013 January Unitised U3 Higher Q16

A surveyor has recorded some measurements of a field on a sketch, as shown in the diagram.



The surveyor needs to know the length of the side *AD* in order to arrange for a drain to be installed. Calculate the length *AD*. [7]

Assessment for Learning

Video / QR code

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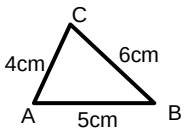
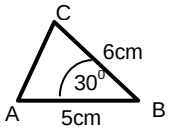
Starter. Which rule would you use?



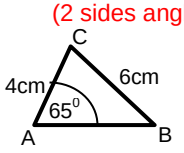
Find Angle ACB

Rule Cosine Rule (3 sides)

Find length AC



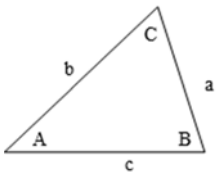
Rule Cosine Rule (2 sides angle)



Find Angle ABC

Rule Sine Rule (angle and opp side)

Top Tips!



Use to find **side**

$$\frac{a}{SinA} = \frac{b}{SinB} = \frac{c}{SinC}$$

Use to find **angle**

$$\frac{SinA}{a} = \frac{SinB}{b} = \frac{SinC}{c}$$

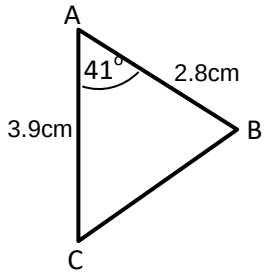
SINE RULE
To use the sine rule you must have **an angle and opposite side**

COSINE RULE
Use with questions were **Two sides** and the **angle** between them *or* **all three sides** is known

$$a^2 = b^2 + c^2 - 2bc\ cosA$$

Skills:

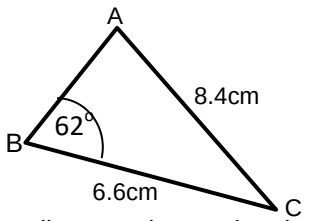
Calculate the length of side BC



Cosine Rule $a^2 = b^2 + c^2 - 2bc\ cosA$

$a^2 = 3.9^2 + 2.8^2 - 2 \times 3.9 \times 2.8 \times \cos 41$

$a^2 = 6.57$ $a = 2.6cm$



The diagram shows triangle *ABC*.
Calculate the size of the acute angle *BAC*

Sine Rule $\frac{SinA}{a} = \frac{SinB}{b} = \frac{SinC}{c}$

$\frac{SinA}{6.6} = \frac{Sin62}{8.4}$

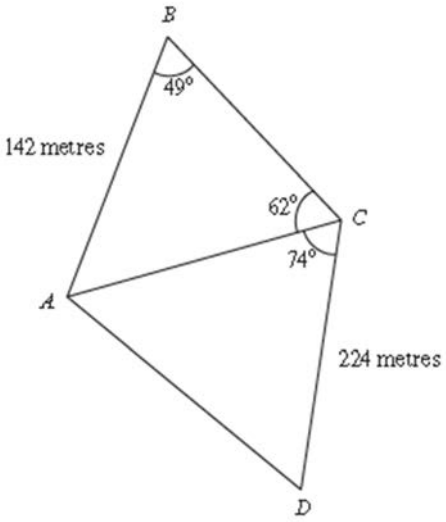
$SinA = \frac{Sin62}{8.4} \times 6.6$

$SinA = 0.6937$ $A = 43.9^o$

Examination Question:

2013 January Unitised U3 Higher Q16

A surveyor has recorded some measurements of a field on a sketch, as shown in the diagram.



The surveyor needs to know the length of the side *AD* in order to arrange for a drain to be installed. Calculate the length *AD*. [7]

Length AC Sine Rule $\frac{a}{SinA} = \frac{b}{SinB} = \frac{c}{SinC}$

$\frac{AC}{Sin49} = \frac{142}{Sin62}$ $AC = \frac{142}{Sin62} \times Sin49$

$AC = 121.4m$

Length AD Cosine Rule $a^2 = b^2 + c^2 - 2bc\ cosA$

$a^2 = 121^2 + 224^2 - 2 \times 121 \times 224 \times \cos 74$

$a^2 = 49875$

$a = 223m$

Assessment for Learning

Video / QR code


GwE


GwE