

Section 2.5 The cosine rule

Sine Rule

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

Interested in?

2 angles
+ 2 sides

Cosine Rule

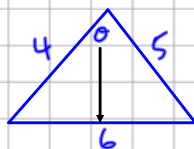
$$a^2 = b^2 + c^2 - 2bc \cos A$$

Interested in?

3 sides
+ 1 angle

8. The lengths of the sides of a triangle are 4 cm, 5 cm and 6 cm.
The largest angle of the triangle is θ .
- Find the value of $\cos \theta$ as a fraction.
 - Hence show that $\sin \theta = \frac{a\sqrt{7}}{b}$, where a and b are integers, and write down their values.

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



$$6^2 = 4^2 + 5^2 - 2(4)(5) \cos \theta$$

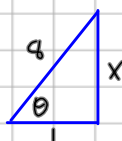
$$36 = 41 - 40 \cos \theta$$

$$-5 = -40 \cos \theta$$

$$\cos \theta = \frac{-5}{-40}$$

$$\Rightarrow \cos \theta = \frac{1}{8}$$

$$a^2 = b^2 + c^2$$



$$8^2 = x^2 + 1^2$$

$$64 = x^2 + 1$$

$$x^2 = 63$$

$$x = \sqrt{63} = 3\sqrt{7}$$

$$\sin \theta = \frac{a}{b}$$

$$\sin \theta = \frac{3\sqrt{7}}{8}$$