

Lesson Three: The Cosine Law

Sometimes when we set up a triangle, we do not know an angle and its opposite side. In such cases, the Law of Sines will not work. We need to use the Law of Cosines.

Law of Cosines

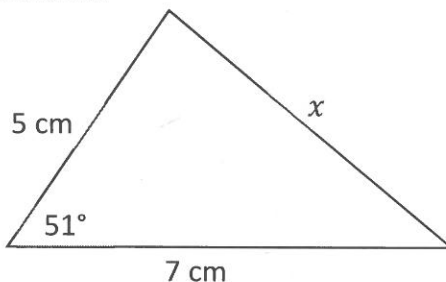
$$a^2 = b^2 + c^2 - 2bc \cos A$$

Or

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

Example 1

Determine the length of the side labelled x .



What makes this question different from a sine law question is that there are no 'partners' given – we have no angle and opposite side pair where both values are provided.

If there are no 'partners' given, you are looking at a *cosine law* question. Before you start with the formula for cosine law, LABEL WHAT YOU ARE LOOKING FOR 'a' (if looking for a side) or 'A' (if looking for an angle).

In this triangle we are looking for side x , so label that 'a' (and label the opposite angle 'A'), as shown below:

