

The Panda Math Tutor

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The Sine & Cosine Rules

Student Worksheet
Questions & Working Space
IGCSE Mathematics

Name: _____

Date: _____

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Teach → Practice → Reason → Apply → Challenge → Master

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Note

How to use this worksheet. These questions are built *strictly* on the *Sine & Cosine Rules* notes: standard labelling of non-right-angled triangles, the Sine Rule for sides and for angles, the ambiguous case (SSA), the Cosine Rule for sides and for angles, the area formula $\frac{1}{2}ab\sin C$, choosing the correct rule, and multi-step problems.

Calculator. A calculator is needed throughout. Make sure it is in **degree mode**. Keep full accuracy in your calculator memory and round only at the *final* step — rounding early is the most common cause of lost marks in this topic.

Working space. Ruled lines are provided after each question — show *all* of your working there, name the rule you are using, and state the accuracy asked for. Harder questions have a teal **Hint** box; try the question first and use the hint only if you are stuck.

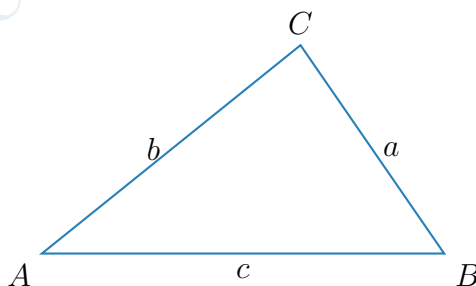
Checking your answers. Full step-by-step solutions, a marking scheme for the exam paper, and a quick answer key are in the separate booklet “*The Sine & Cosine Rules — Solutions & Answer Key*.” Try each question honestly before you look.

1 Part I — Topic-by-Topic Exercises

1.1 Labelling and Choosing the Rule

Note

Reminder of the standard convention: capital letters for angles, and each lowercase letter for the side *opposite* the angle of the same name.

**Exercise L1 [Basic]**

In triangle DEF , angle $D = 47^\circ$ and angle $E = 61^\circ$. Write down the size of angle F , and state which side of the triangle is opposite angle F .

Exercise L2 [*Basic*]

In triangle KLM , angle $K = 38^\circ$, $k = 7.4$ cm and $l = 9.1$ cm. State which angle side l is opposite, and say whether the information given is AAS, SAS, SSA or SSS.

Exercise L3 [*Standard*]

For each triangle, state which rule you would use and give a brief reason. Do **not** carry out the calculation.

- (a) $b = 10$ cm, $c = 14$ cm, $A = 68^\circ$; find a .
 - (b) $A = 41^\circ$, $C = 96^\circ$, $b = 15$ cm; find c .
 - (c) $a = 12$ cm, $b = 19$ cm, $c = 23$ cm; find the largest angle.
 - (d) $a = 8$ cm, $c = 13$ cm, $B = 74^\circ$; find the area.
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Exercise L4 [*Intermediate*]

A student is given $b = 11$ cm, $c = 16$ cm and angle $A = 55^\circ$, and starts by writing $\frac{a}{\sin A} = \frac{b}{\sin B}$. Explain why the Sine Rule cannot be used to find a here, and state which rule should be used instead.

Preview ends here

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