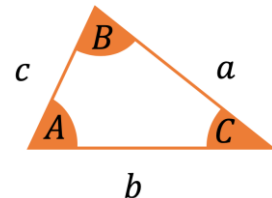




Sine, Cosine & Area Rules

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From the Pythagorean theorem and trigonometric ratios, you have learned how to solve for unknown sides and angles. However, these rules only apply to right-angled triangles.



The sine, cosine and area rules below are formulas that can be used for all types of triangles.

Sine Rule

$$\frac{a}{\sin(A)} = \frac{b}{\sin(B)} = \frac{c}{\sin(C)}$$

$$\frac{\sin(A)}{a} = \frac{\sin(B)}{b} = \frac{\sin(C)}{c}$$

Cosine Rule

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

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

Area Rule

The area of a triangle is typically found with the formula $A = \frac{1}{2}bh$. However, when we are not given a perpendicular height, we can use another formula that involves angles.

$$A = \frac{1}{2}ab \times \sin(C)$$

Important Note

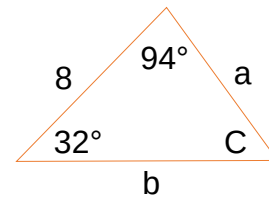
Equations can be adjusted based on the variables required to find.
EXAMPLE: Find the area given b, c and A.

Adjust the area rule to: $A = \frac{1}{2}bc \times \sin(A)$

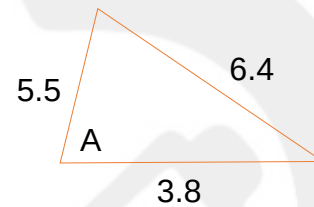


Instructions: Solve for the unknowns below (images not drawn to scale).

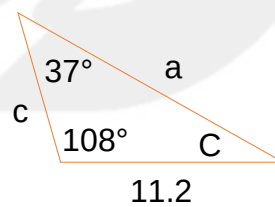
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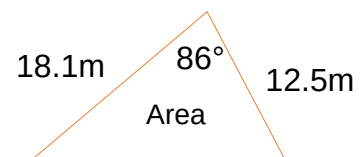
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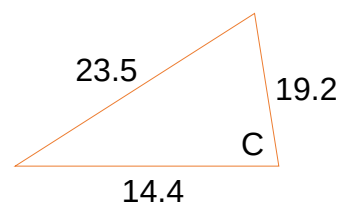


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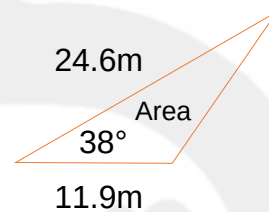




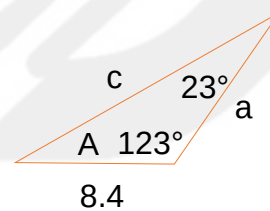
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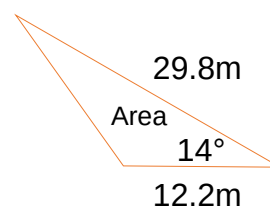
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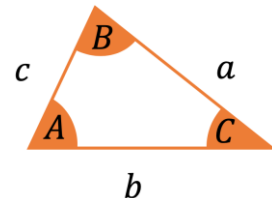




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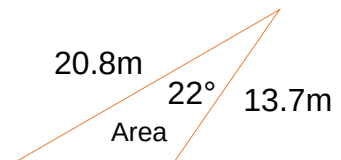
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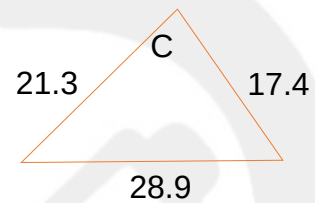


Instructions: Solve for the unknowns below (images not drawn to scale).

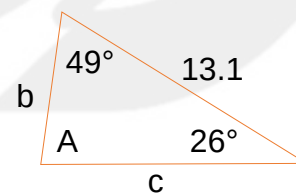
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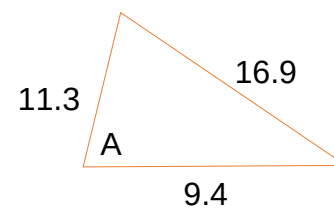
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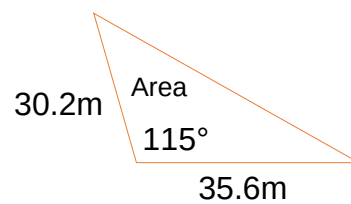


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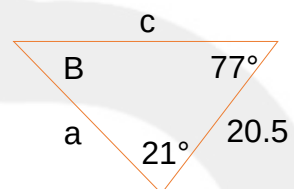




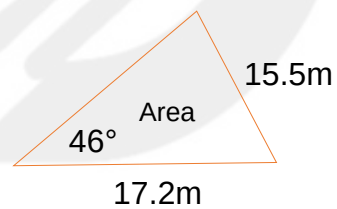
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