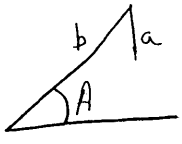
# Law of Sines

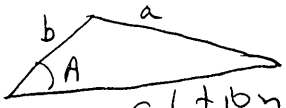
$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$$

SAA or ASA – one solution

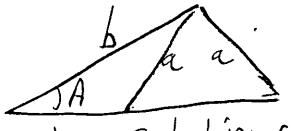
SSA – ambiguous case: Could have no solution, 1 solution or 2 solutions.




no solution




one solution




two solutions

Step 1: Use Law of Sines

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

Solve for sin B. If sin B > 1, no solution.

Solve for B. This is one possible answer.

Calculate 180 − B. This is a second possible answer.

If A + B < 180, then the value of B is an answer. Check this for both possible answers. You will have either one solution or two solutions.

# Law of Cosines

$c^2 = a^2 + b^2 - 2ab\cos C$

$b^2 = a^2 + c^2 - 2ac\cos B$

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

Solve SAS or SSS triangles.

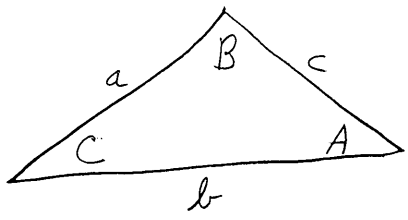
# Area of a Triangle

$A_\Delta = \frac{1}{2}bh$

$A_\Delta = \frac{1}{2}ab\sin C$

$= \frac{1}{2}bc\sin A$

$= \frac{1}{2}ac\sin C$

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$A_\Delta = \sqrt{s(s-a)(s-b)(s-c)}$ where $s = \frac{1}{2}(a+b+c)$

[Heron's Formula given a, b, & c]