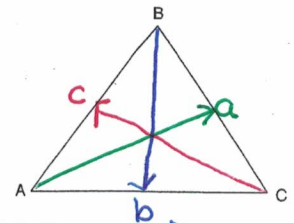


# 7.1 – Law of Sines

Law of Sines "Formulas"/Proportions →  $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$



– Only use the Law of Sines to solve a triangle if given the following: (ASA, AAS, SSA)

Given Triangle # 1	Given Triangle # 2	Given Triangle # 3
<p>Included Side (the side between the angles)</p> <p>Type of Triangle: <b>ASA</b></p>	<p>a non-included side!</p> <p>Type of Triangle: <b>AAS</b></p>	<p>Type of Triangle: <b>SSA</b></p>

**Example 1:** Find indicated side or indicated angle. Round to tenth place.

<p>a.) Find side a. <b>AAS</b></p> $\frac{a}{\sin 66} = \frac{25}{\sin 52}$ $a \sin 52 = \frac{25 \sin 66}{\sin 52}$ <p><b>a = 29</b></p>	<p>b.) Find angle C. <b>SSA</b></p> <p><b>C = 33.9°</b></p> $\frac{32}{\sin 110} = \frac{19}{\sin C}$ $32 \sin C = \frac{19 \sin 110}{32}$ $\sin C = .5579424936$ $C = \sin^{-1}(.5579424936)$	<p>c.) Find side x. <b>ASA</b></p> <p>① Find y: <math>\sin 52 = \frac{13}{y}</math>, <math>y = 16.5</math></p> <p>② Find x: <math>\frac{16.5}{\sin 34} = \frac{x}{\sin 18}</math>, <b>x = 9.1</b></p>	<p>d.) Find angle θ. <b>SSA</b></p> <p>① mLA: <math>\frac{28}{\sin A} = \frac{33}{\sin 83}</math>, <math>33 \sin A = \frac{28 \sin 83}{33}</math>, <math>\sin A = \frac{28 \sin 83}{33}</math>, <math>A = \sin^{-1}(\frac{28 \sin 83}{33})</math>, mLA = 57.4°</p> <p>② mLC: <math>\theta = 180 - (83 + 57.4)</math>, <b>θ = 39.6°</b></p>
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**Example 2:** Solve each triangle. Round to tenth place.

<p>a.) <b>ASA</b></p> <p>① mLB: <math>180 - (38 + 84)</math>, <b>mLB = 58°</b></p> <p>② Side a: <math>\frac{a}{\sin 84} = \frac{29}{\sin 58}</math>, <math>a \sin 58 = 29 \sin 84</math>, <b>a = 34</b></p> <p>③ Side c: <math>\frac{29}{\sin 58} = \frac{c}{\sin 38}</math>, <math>c \sin 58 = 29 \sin 38</math>, <b>c = 21.1</b></p>	<p>b.) <b>SSA</b></p> <p>① mLA: <math>\frac{20}{\sin A} = \frac{28}{\sin 76}</math>, <math>28 \sin A = 20 \sin 76</math>, <b>mLA = 43.9°</b></p> <p>② mLC: <math>C = 180 - (76 + 43.9)</math>, <b>C = 60.1°</b></p> <p>③ Side c: <math>\frac{28}{\sin 76} = \frac{c}{\sin 60.1}</math>, <math>c \sin 76 = 28 \sin 60.1</math>, <b>c = 25</b></p>
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