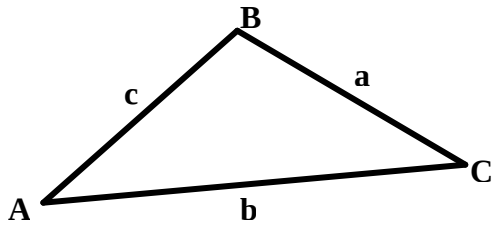
Oblique Triangles



Law of Sines		$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$
Law of Cosines		$a^2 = b^2 + c^2 - 2bc \times \cos A$ $b^2 = a^2 + c^2 - 2ac \times \cos B$ $c^2 = a^2 + b^2 - 2ab \times \cos C$
Sum of Angles		$A + B + C = 180^0$
K = Area		$s = \frac{a + b + c}{2}$
Given	**To Find**	**Equation**
a, b, c	**A**	$\sin\frac{A}{2} = \sqrt{\frac{(s-b)(s-c)}{bc}}$ $\cos\frac{A}{2} = \sqrt{\frac{s(s-a)}{bc}}$ $\tan\frac{A}{2} = \sqrt{\frac{(s-b)(s-c)}{s(s-a)}}$

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Given	To Find	Equation
a, b, c	B	$\sin\frac{B}{2} = \sqrt{\frac{(s-a)(s-c)}{ac}}$ $\cos\frac{B}{2} = \sqrt{\frac{s(s-b)}{ac}}$ $\tan\frac{B}{2} = \sqrt{\frac{(s-a)(s-c)}{s(s-b)}}$
a, b, c	C	$\sin\frac{C}{2} = \sqrt{\frac{(s-a)(s-b)}{ab}}$ $\cos\frac{C}{2} = \sqrt{\frac{s(s-c)}{ab}}$ $\tan\frac{C}{2} = \sqrt{\frac{(s-a)(s-b)}{s(s-c)}}$
a, b, c	K	$K = \sqrt{s(s-a)(s-b)(s-c)}$
a, A, B	b, c	$b = \frac{a \times \sin B}{\sin A}$ $\quad c = \frac{a \times \sin(A+B)}{\sin A}$
a, A, B	K	$K = \frac{ab \times \sin C}{2} = \frac{a^2 \times \sin B \times \sin C}{2 \times \sin A}$
a, b, A	B	$\sin B = \frac{b \times \sin A}{a}$
a, b, A	c	$c = \frac{a \times \sin C}{\sin A} = \frac{b \times \sin C}{\sin B}$ $c = \sqrt{(a^2 + b^2 - 2ab \times \cos C)}$
a, b, A	K	$K = \frac{ab \times \sin C}{2}$
a, b, C	A	$\tan A = \frac{a \times \sin C}{b - a \times \cos C}$
a, b, C	c	$c = \frac{a \times \sin(A+B)}{\sin A}$ $c = \sqrt{(a^2 + b^2 - 2ab \times \cos C)}$
a, b, C	K	$K = \frac{ab \times \sin C}{2}$