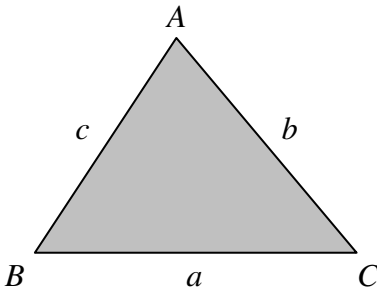


Basic Relations	$\sin^2 x + \cos^2 x = 1, \quad 1 + \tan^2 x = \frac{1}{\cos^2 x}, \quad \tan x = \frac{\sin x}{\cos x}$ $\sec x = \frac{1}{\cos x}, \quad \operatorname{cosec} x = \frac{1}{\sin x}, \quad \cotan x = \frac{\cos x}{\sin x} = \frac{1}{\tan x}$
Double angle relations	$\sin 2x = 2 \sin x \cos x, \quad \cos 2x = \cos^2 x - \sin^2 x, \quad \tan 2x = \frac{2 \tan x}{1 - \tan^2 x}$
Half angle relations	$\sin \frac{x}{2} = \pm \sqrt{\frac{1 - \cos x}{2}}, \quad \cos \frac{x}{2} = \pm \sqrt{\frac{1 + \cos x}{2}}, \quad \tan \frac{x}{2} = \pm \sqrt{\frac{1 - \cos x}{1 + \cos x}}$
Angle sum relations	$\sin(a + b) = \sin a \cos b + \cos a \sin b$ $\sin(a - b) = \sin a \cos b - \cos a \sin b$ $\cos(a + b) = \cos a \cos b - \sin a \sin b$ $\cos(a - b) = \cos a \cos b + \sin a \sin b$ $\tan(a + b) = \frac{\tan a + \tan b}{1 - \tan a \cdot \tan b}$ $\tan(a - b) = \frac{\tan a - \tan b}{1 + \tan a \cdot \tan b}$
Sum and difference relations	$\sin a + \sin b = 2 \sin \frac{a+b}{2} \cos \frac{a-b}{2}$ $\cos a + \cos b = 2 \cos \frac{a+b}{2} \cos \frac{a-b}{2}$ $\sin a - \sin b = 2 \cos \frac{a+b}{2} \sin \frac{a-b}{2}$ $\cos a - \cos b = -2 \sin \frac{a+b}{2} \sin \frac{a-b}{2}$

Triangle formulas

Law of Sines	$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$	
Law of Cosines	$a^2 = b^2 + c^2 - 2bc \cos A$ $b^2 = a^2 + c^2 - 2ac \cos B$ $c^2 = a^2 + b^2 - 2ab \cos C$	
Sum of the angles	$A + B + C = 180^\circ$	