

Standard Trigonometric Identities (Reference Sheet)

1. Pythagorean Identities

$\sin^2 \theta + \cos^2 \theta = 1$	$1 + \tan^2 \theta = \sec^2 \theta$
$1 + \cot^2 \theta = \csc^2 \theta$	

2. Reciprocal Identities

$\sin \theta = \frac{1}{\csc \theta}$	$\cos \theta = \frac{1}{\sec \theta}$
$\tan \theta = \frac{1}{\cot \theta}$	

3. Quotient Identities

$\tan \theta = \frac{\sin \theta}{\cos \theta}$	$\cot \theta = \frac{\cos \theta}{\sin \theta}$
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4. Even–Odd Symmetry

$\sin(-\theta) = -\sin \theta$	$\cos(-\theta) = \cos \theta$
$\tan(-\theta) = -\tan \theta$	

5. Cofunction Identities

$\sin\left(\frac{\pi}{2} - \theta\right) = \cos \theta$	$\tan\left(\frac{\pi}{2} - \theta\right) = \cot \theta$
$\sec\left(\frac{\pi}{2} - \theta\right) = \csc \theta$	

6. Sum and Difference Formulas

$\sin(\alpha \pm \beta) = \sin \alpha \cos \beta \pm \cos \alpha \sin \beta$	$\cos(\alpha \pm \beta) = \cos \alpha \cos \beta \mp \sin \alpha \sin \beta$
$\tan(\alpha \pm \beta) = \frac{\tan \alpha \pm \tan \beta}{1 \mp \tan \alpha \tan \beta}$	

7. Double–Angle Formulas

$\sin(2\theta) = 2 \sin \theta \cos \theta$	$\cos(2\theta) = \cos^2 \theta - \sin^2 \theta$
$\cos(2\theta) = 2 \cos^2 \theta - 1 = 1 - 2 \sin^2 \theta$	$\tan(2\theta) = \frac{2 \tan \theta}{1 - \tan^2 \theta}$