

Trigonometric Identities

Here is a list of many of the identities from trigonometry. These identities may be used to verify or establish other identities.

<p>Reciprocal Identities</p> <p>$\cot = \frac{1}{\tan}$</p> <p>$\sec = \frac{1}{\cos}$</p> <p>$\csc = \frac{1}{\sin}$</p>	<p>Ratios</p> <p>$\tan = \frac{\sin}{\cos}$</p> <p>$\cot = \frac{\cos}{\sin}$</p>
<p>Angle</p>	
<p>$\cos(\theta) = \frac{1}{\csc(\theta)}$</p> <p>$\csc(\theta) = \frac{1}{\cos(\theta)}$</p> <p>$\tan(\theta) = \frac{1}{\cot(\theta)}$</p> <p>$\cot(\theta) = \frac{1}{\tan(\theta)}$</p>	<p>Pythagorean</p>
<p>Double Angle</p> <p>$\cos(2\theta) = \cos^2(\theta) - \sin^2(\theta)$</p> <p>$\sin(2\theta) = 2\sin(\theta)\cos(\theta)$</p> <p>$\tan(2\theta) = \frac{2\tan(\theta)}{1 - \tan^2(\theta)}$</p>	
<p>Half Angle</p> <p>$\sin\left(\frac{\theta}{2}\right) = \pm \sqrt{\frac{1 - \cos(\theta)}{2}}$</p> <p>$\cos\left(\frac{\theta}{2}\right) = \pm \sqrt{\frac{1 + \cos(\theta)}{2}}$</p> <p>$\tan\left(\frac{\theta}{2}\right) = \frac{\sin(\theta)}{1 + \cos(\theta)} = \frac{1 - \cos(\theta)}{\sin(\theta)}$</p>	
<p>Sum and Difference</p> <p>$\sin(\alpha \pm \beta) = \sin(\alpha)\cos(\beta) \pm \cos(\alpha)\sin(\beta)$</p> <p>$\cos(\alpha \pm \beta) = \cos(\alpha)\cos(\beta) \mp \sin(\alpha)\sin(\beta)$</p> <p>$\tan(\alpha \pm \beta) = \frac{\sin(\alpha)\cos(\beta) \pm \cos(\alpha)\sin(\beta)}{\cos(\alpha)\cos(\beta) \mp \sin(\alpha)\sin(\beta)}$</p>	<p>Product-to-Sum</p> <p>$\sin(\alpha)\cos(\beta) = \frac{1}{2}[\sin(\alpha + \beta) + \sin(\alpha - \beta)]$</p> <p>$\cos(\alpha)\cos(\beta) = \frac{1}{2}[\cos(\alpha + \beta) + \cos(\alpha - \beta)]$</p> <p>$\sin(\alpha)\sin(\beta) = \frac{1}{2}[\cos(\alpha - \beta) - \cos(\alpha + \beta)]$</p> <p>$\cos(\alpha)\sin(\beta) = \frac{1}{2}[\sin(\alpha + \beta) - \sin(\alpha - \beta)]$</p>

