

Trig Identities to memorize

<p>The Pythagorean Identities</p> $\sin^2 \theta + \cos^2 \theta = 1$ $\begin{cases} \cos^2 \theta = 1 - \sin^2 \theta \\ \sin^2 \theta = 1 - \cos^2 \theta \end{cases}$ $\tan^2 \theta + 1 = \sec^2 \theta$ $\cot^2 \theta + 1 = \csc^2 \theta$	<p>The Reciprocal Identities</p> $\csc \theta = \frac{1}{\sin \theta}$ $\sec \theta = \frac{1}{\cos \theta}$ $\cot \theta = \frac{1}{\tan \theta}$	<p>The Ratio Identities</p> $\tan \theta = \frac{\sin \theta}{\cos \theta}$ $\cot \theta = \frac{\cos \theta}{\sin \theta}$
<p>The negation identities</p> $\sin(-\theta) = -\sin \theta$ $\cos(-\theta) = \cos \theta$ $\tan(-\theta) = -\tan \theta$	<p>The Co-function Identities</p> $\sin\left(\frac{\pi}{2} - \theta\right) = \cos \theta \quad \cos\left(\frac{\pi}{2} - \theta\right) = \sin \theta$ $\tan\left(\frac{\pi}{2} - \theta\right) = \cot \theta \quad \cot\left(\frac{\pi}{2} - \theta\right) = \tan \theta$ $\sec\left(\frac{\pi}{2} - \theta\right) = \csc \theta \quad \csc\left(\frac{\pi}{2} - \theta\right) = \sec \theta$	
<p>The angle addition & subtraction</p> $\cos(\alpha \pm \beta) = \cos \alpha \cos \beta \mp \sin \alpha \sin \beta$ $\sin(\alpha \pm \beta) = \sin \alpha \cos \beta \pm \cos \alpha \sin \beta$ $\tan(\alpha \pm \beta) = \frac{\tan \alpha \pm \tan \beta}{1 \mp \tan \alpha \tan \beta}$	<p>Double Angle Identities</p> $\sin 2\theta = 2 \sin \theta \cos \theta$ $\cos 2\theta = \begin{cases} \cos^2 \theta - \sin^2 \theta \\ 2 \cos^2 \theta - 1 \\ 1 - 2 \sin^2 \theta \end{cases}$ $\tan 2\theta = \frac{2 \tan \theta}{1 - \tan^2 \theta}$	<p>Half Angle Identities</p> $\sin \frac{\theta}{2} = \pm \sqrt{\frac{1 - \cos \theta}{2}}$ $\cos \frac{\theta}{2} = \pm \sqrt{\frac{1 + \cos \theta}{2}}$ $\tan \frac{\theta}{2} = \begin{cases} \pm \sqrt{\frac{1 - \cos \theta}{1 + \cos \theta}} \\ \frac{1 - \cos \theta}{\sin \theta} \\ \frac{\sin \theta}{1 + \cos \theta} \end{cases}$ <p>Where \pm depends on Quad.</p>

