

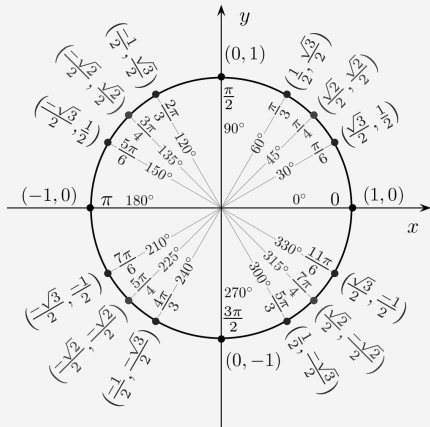
Double Angle Identities

$$\begin{aligned}\sin(2a) &= 2\sin(a)\cos(a) \\ \cos(2a) &= \cos^2(a) - \sin^2(a) \\ \cos(2a) &= 2\cos^2(a) - 1 \\ \cos(2a) &= 1 - \sin^2(a) \\ \tan(2a) &= \frac{2\tan(a)}{1 - \tan^2(a)}\end{aligned}$$

Angle Sum/Difference Identities

$$\begin{aligned}\sin(A-B) &= \sin A \cos B - \cos A \sin B \\ \cos(A-B) &= \cos A \cos B + \sin A \sin B \\ \tan(A-B) &= \frac{\tan A - \tan B}{1 + \tan A \tan B} \\ \sin(A+B) &= \sin A \cos B + \cos A \sin B \\ \cos(A+B) &= \cos A \cos B - \sin A \sin B \\ \tan(A+B) &= \frac{\tan A + \tan B}{1 - \tan A \tan B}\end{aligned}$$

Unit Circle



Reciprocal Identities and Cotangent/Tangent

$$\begin{aligned}\csc x &= 1/\sin x \\ \sec x &= 1/\cos x \\ \cot x &= 1/\tan x \\ \tan x &= \sin x/\cos x \\ \cot x &= \cos x/\sin x\end{aligned}$$

Pythagorean Identities

$$\begin{aligned}\cos^2 x + \sin^2 x &= 1 \\ 1 + \tan^2 x &= \sec^2 x \\ 1 + \cot^2 x &= \csc^2 x\end{aligned}$$

Common Functions

$f(x) = mx + b$ is a line moving up
 $f(x) = x^2$ is a parabola
 $f(x) = x^3$ is a half parabola with a reflection under the x axis
 $f(x) = \sqrt{x}$ is a half sideways parabola on the positive side of the first quadrant

Half Angle Identities

$$\begin{aligned}\sin A/2 &= \pm \sqrt{1 - \cos A} \\ \cos A/2 &= \pm \sqrt{1 + \cos A} \\ \tan A/2 &= \pm \sqrt{\frac{1 - \cos A}{1 + \cos A}}\end{aligned}$$

Domain and Range

