

TRIGONOMETRIC IDENTITIES

FUNDAMENTAL TRIGONOMETRIC IDENTITIES		
<u>Reciprocal Identities:</u> <ul style="list-style-type: none"> • $\csc x = \frac{1}{\sin x}$ • $\sec x = \frac{1}{\cos x}$ • $\cot x = \frac{1}{\tan x}$ 	<u>Quotient Identities:</u> <ul style="list-style-type: none"> • $\tan x = \frac{\sin x}{\cos x}$ • $\cot x = \frac{\cos x}{\sin x}$ 	<u>Pythagorean Identities:</u> <ul style="list-style-type: none"> • $\sin^2 x + \cos^2 x = 1$ • $1 + \cot^2 x = \csc^2 x$ • $\tan^2 x + 1 = \sec^2 x$

SUM & DIFFERENCE IDENTITIES:

$$\sin(A + B) = \sin A \cos B + \sin B \cos A$$

$$\sin(A - B) = \sin A \cos B - \sin B \cos A$$

$$\cos(A + B) = \cos A \cos B - \sin A \sin B$$

$$\cos(A - B) = \cos A \cos B + \sin A \sin B$$

$$\tan(A + B) = \frac{\tan A + \tan B}{1 - \tan A \tan B}$$

$$\tan(A - B) = \frac{\tan A - \tan B}{1 + \tan A \tan B}$$

DOUBLE ANGLE IDENTITIES:

$$\sin 2A = 2 \sin A \cos A$$

$$\begin{aligned} \cos 2A &= \cos^2 A - \sin^2 A \\ &= 1 - 2 \sin^2 A \\ &= 2 \cos^2 A - 1 \end{aligned}$$

$$\tan 2A = \frac{2 \tan A}{1 - \tan^2 A}$$

