

TRIGONOMETRIC IDENTITIES

PYTHAGOREAN

$$\sin^2 \theta + \cos^2 \theta = 1$$

$$\tan^2 \theta + 1 = \sec^2 \theta$$

$$1 + \cot^2 \theta = \csc^2 \theta$$

QUOTIENT

$$\tan \theta = \frac{\sin \theta}{\cos \theta}$$

$$\cot \theta = \frac{\cos \theta}{\sin \theta}$$

RECIPROCAL

$$\cos \theta = \frac{1}{\sec \theta}$$

$$\sec \theta = \frac{1}{\cos \theta}$$

$$\sin \theta = \frac{1}{\csc \theta}$$

$$\csc \theta = \frac{1}{\sin \theta}$$

$$\tan \theta = \frac{1}{\cot \theta}$$

$$\cot \theta = \frac{1}{\tan \theta}$$

NEGATIVE

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

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

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

$$\sec (-\theta) = \sec \theta$$

$$\csc(-\theta) = -\csc \theta$$

$$\cot(-\theta) = -\cot \theta$$

COFUNCTIONS

$$\cos (90-\theta) = \sin \theta$$

$$\sec (90-\theta) = \csc \theta$$

$$\tan (90-\theta) = \cot \theta$$

$$\sin (90-\theta) = \cos \theta$$

$$\csc (90-\theta) = \sec \theta$$

$$\cot (90-\theta) = \tan \theta$$

DOUBLE-ANGLE

$$\sin (2\theta) = 2\sin\theta\cos\theta$$

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

$$\cos (2\theta) = \cos^2 \theta - \sin^2 \theta$$

$$= 1 - 2\sin^2 \theta$$

$$= 2\cos^2 \theta - 1$$

SUM & DIFFERENCE

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

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

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

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

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

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