

TRIGONOMETRY

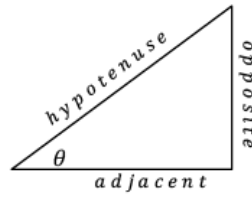
DEFINITION

RIGHT TRIANGLE DEFINITION

$$\sin \theta = \frac{\text{opposite}}{\text{hypotenuse}} \quad \csc \theta = \frac{\text{hypotenuse}}{\text{opposite}}$$

$$\cos \theta = \frac{\text{adjacent}}{\text{hypotenuse}} \quad \sec \theta = \frac{\text{hypotenuse}}{\text{adjacent}}$$

$$\tan \theta = \frac{\text{opposite}}{\text{adjacent}} \quad \cot \theta = \frac{\text{adjacent}}{\text{opposite}}$$



TRIGONOMETRIC FUNCTIONS RANGE

$$-1 \leq \sin \theta \leq 1 \quad \csc \theta \leq -1 \text{ and } \csc \theta \geq 1$$

$$-1 \leq \cos \theta \leq 1 \quad \sec \theta \leq -1 \text{ and } \sec \theta \geq 1$$

$$-\infty \leq \tan \theta \quad -\infty \leq \cot \theta \leq \infty$$

DOUBLE ANGLE IDENTITIES

$$\sin \theta = y$$

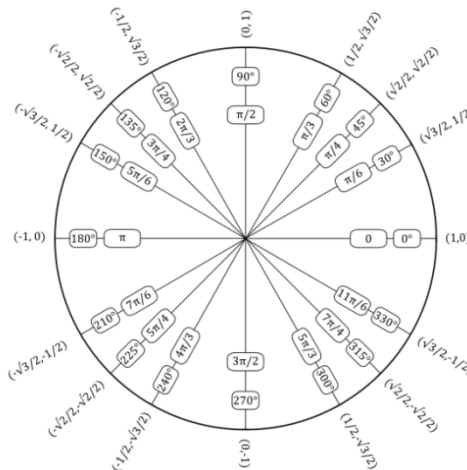
$$\cos \theta = x$$

$$\tan \theta = \frac{y}{x}$$

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

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

$$\cot \theta = \frac{x}{y}$$



TRIGONOMETRIC FUNCTIONS DOMAIN

$\sin \theta, \theta$ can be any angle

$\cos \theta, \theta$ can be any angle

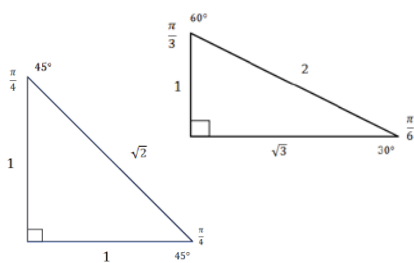
$\tan \theta, \theta \neq \left(n + \frac{1}{2}\right)\pi, n = 0, \pm 1, \pm 2, \dots$

$\csc \theta, \theta \neq n\pi, n = 0, \pm 1, \pm 2, \dots$

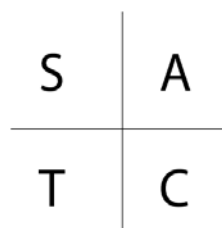
$\sec \theta, \theta \neq \left(n + \frac{1}{2}\right)\pi, n = 0, \pm 1, \pm 2, \dots$

$\cot \theta, \theta \neq n\pi, n = 0, \pm 1, \pm 2, \dots$

EXACT VALUE TRIANGLES



SIGNS IN QUADRANTS



TRIGONOMETRIC FUNCTIONS PERIOD

$$\sin(\omega\theta) \rightarrow T = \frac{2\pi}{\omega} \quad \csc(\omega\theta) \rightarrow T = \frac{2\pi}{\omega}$$

$$\cos(\omega\theta) \rightarrow T = \frac{2\pi}{\omega} \quad \sec(\omega\theta) \rightarrow T = \frac{2\pi}{\omega}$$

$$\tan(\omega\theta) \rightarrow T = \frac{\pi}{\omega} \quad \cot(\omega\theta) \rightarrow T = \frac{\pi}{\omega}$$

INVERSE TRIG FUNCTION NOTATION

$$\sin^{-1} \equiv \arcsin x \equiv A \sin x$$

$$\cos^{-1} \equiv \arccos x \equiv A \cos x$$

$$\tan^{-1} \equiv \arctan x \equiv A \tan x$$

INVERSE TRIG FUNCTION DOMAIN

$$\sin^{-1} x : -1 \leq x \leq 1$$

$$\cos^{-1} x : -1 \leq x \leq 1$$

$$\cot^{-1} x : -\infty \leq x \leq \infty$$

INVERSE TRIG FUNCTION RANGE

$$-\frac{\pi}{2} \leq \sin^{-1} x \leq \frac{\pi}{2}$$

$$0 \leq \cos^{-1} x \leq \pi$$

$$-\frac{\pi}{2} \leq \tan^{-1} x \leq \frac{\pi}{2}$$

MATHS REFERENCE SHEET COLLECTION

A reference sheet for the
hawkermaths.com
senior maths program

Mathematical Applications
Mathematical Methods
Specialist Mathematics

