

C4 Trigonometry

TERMINOLOGY AND CONVENTIONS

Reciprocal functions

The following are the reciprocals of familiar trigonometric functions:

$$\operatorname{cosec} \theta = \frac{1}{\sin \theta}, \quad \sec \theta = \frac{1}{\cos \theta}, \quad \cot \theta = \frac{1}{\tan \theta}$$

This creates a couple new identities derived from existing ones.

As we know, $\sin^2 \theta + \cos^2 \theta = 1$.

If we divide this by $\sin^2 \theta$,

$$1 + \cot^2 \theta = \operatorname{cosec}^2 \theta$$

And if we divide this by $\cos^2 \theta$,

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

Key values of sin, cos and tan

Although this is not essential knowledge, it becomes useful in later sections.

	0°	30°	45°	60°	90°	180°	360°
$\sin \theta$	0	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$	1	0	0
$\cos \theta$	1	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{1}{2}$	0	-1	1
$\tan \theta$	0	$\frac{1}{\sqrt{3}}$	1	$\sqrt{3}$	$\emptyset$	0	0

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