TRIGNOMETRIC REVIEW

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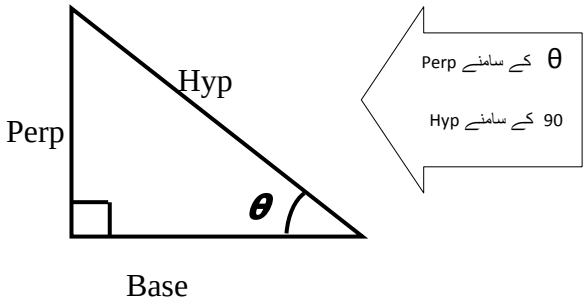
TRIGONOMETRIC RATIOS:



$sin\theta = \frac{Perp}{Hyp}$ | $sin\theta = \frac{1}{csc\theta}$ | $tan\theta = \frac{sin\theta}{cos\theta}$

$cos\theta = \frac{Base}{Hyp}$ | $cos\theta = \frac{1}{sec\theta}$ | $cot\theta = \frac{cos}{sin\theta}$

$tan\theta = \frac{Perp}{Base}$ | $\tan\theta = \frac{1}{cot\theta}$

PYTHAGOREAN THEOREM AND PYTHAGOREAN IDENTITIES:

$(Base)^2 + (Perp)^2 = (Hyp)^2$ $\quad sin^2\theta + cos^2\theta = 1$ $\quad 1 + tan^2\theta = sec^2\theta$ $\quad 1 + cot^2\theta = csc^2\theta$

SIGN IDENTITIES:

$\sin(-\theta) = -sin\theta$ $\quad \cos(-\theta) = cos\theta$ $\quad \tan(-\theta) = -tan\theta$

$\csc(-\theta) = -csc\theta$ $\quad \sec(-\theta) = \sec\theta$ $\quad \cot(-\theta) = -cot\theta$

$\sin(\alpha + \beta) = sin\alpha\ cos\beta + cos\alpha\ sin\beta$ $\quad \sin(\alpha - \beta) = sin\alpha\ cos\beta - cos\alpha\ sin\beta$

$\cos(\alpha + \beta) = co\alpha\ cos\beta - sin\alpha\ sin\beta$ $\quad \cos(\alpha - \beta) = cos\alpha\ cos\beta + sin\alpha\ sin\beta$

$\tan(\alpha + \beta) = \frac{tan\alpha + tan\beta}{1 - tan\alpha\ tan\beta}$ $\quad \tan(\alpha - \beta) = \frac{tan\alpha - tan\beta}{1 + tan\alpha\ tan\beta}$

DOUBLE ANGLE:

$\sin 2\alpha = 2sin\alpha\ cos\alpha$ $\quad cos2\alpha = cos^2\alpha - sin^2\alpha$ $\quad tan2\alpha = \frac{2tan}{1-tan^2\alpha}$

HALF ANGLE:

$sin^2\frac{\alpha}{2} = \frac{1-cos\alpha}{2}$ $\quad cos^2\frac{\alpha}{2} = \frac{1+cos\alpha}{2}$ $\quad tan^2\frac{\alpha}{2} = \frac{1-cos\alpha}{1+cos\alpha}$

SUM TO PRODUCT:

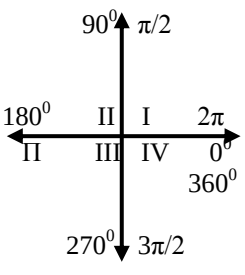
$sin\alpha + sin\beta = 2sin\frac{\alpha+\beta}{2}cos\frac{\alpha-\beta}{2}$ $\quad sin\alpha - sin\beta = 2cos\frac{\alpha+\beta}{2}sin\frac{\alpha-\beta}{2}$

$cos\alpha + cos\beta = 2cos\frac{\alpha+\beta}{2}cos\frac{\alpha-\beta}{2}$ $\quad cos\alpha - cos\beta = -2sin\frac{\alpha+\beta}{2}sin\frac{\alpha-\beta}{2}$

PRODUCT TO SUM:

$2sin\alpha\ cos\beta = \sin(\alpha + \beta) + \sin(\alpha - \beta)$ $\quad 2cos\alpha\ sin\beta = \sin(\alpha + \beta) - \sin(\alpha - \beta)$

$2cos\alpha\ cos\beta = \cos(\alpha + \beta) + \cos(\alpha - \beta)$ $\quad -2sin\alpha\ sin\beta = \cos(\alpha + \beta) - \cos(\alpha - \beta)$



θ degree	0	30	45	60	90	180	270	360
θ readian	0	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$	π	$\frac{3\pi}{2}$	2π
sin θ	0	1/2	$1/\sqrt{2}$	$\sqrt{3}/2$	1	0	-1	0
cos θ	1	$\sqrt{3}/2$	$1/\sqrt{2}$	½	0	-1	0	1
tan θ	0	$1/\sqrt{3}$	1	$\sqrt{3}$	∞	0	∞	0