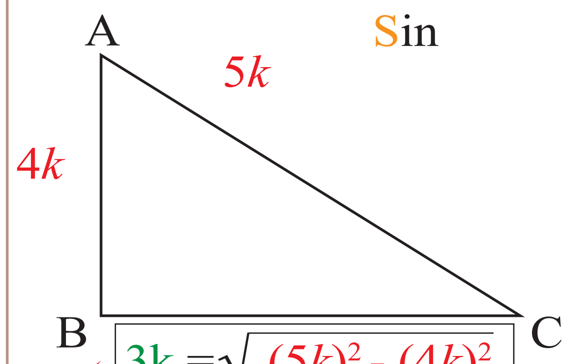
TRIGONOMETRY AT A GLANCE

Trigonometric ratio's in right angled triangle:

Remember "OSHACHOTA".

Cosec	Sec	Cot
O **S** H	A **C** H	O **T** A
Sin	Cos	Tan

Reverse



$3k = \sqrt{(5k)^2 - (4k)^2}$

By Pythagorean theorem

If Sin A = $\frac{4}{5}$, then

Sin C $= \frac{4}{5} = \frac{4k}{5k} = \frac{O}{H}$

- Sos C $= \frac{A}{H} = \frac{3k}{5k} = \frac{3}{5}$
- Tan C $= \frac{O}{A} = \frac{4k}{3k} = \frac{4}{3}$
- Cot C $= \frac{A}{O} = \frac{3k}{4k} = \frac{3}{4}$
- Sec C $= \frac{H}{A} = \frac{4k}{3k} = \frac{5}{3}$
- Cosec C $= \frac{H}{O} = \frac{4k}{3k} = \frac{5}{3}$

Trigonometric ratio of complementary angles:

Sine and Cosine are complementary of each other.
sin (90° − θ) = $\cos\theta$ and $\cos(90° - \theta) = \sin\theta$.

Tangent and Cotangent are complementary of each other.
tan (90° − θ) = $\cot\theta$ and $\cot(90° - \theta) = \tan\theta$.

Secant and Cosecant are complementary of each other.
cosec (90° − θ) = $\sec\theta$ and $\sec(90° - \theta) = \operatorname{cosec}\theta$.

Identities:

$\sin\theta = \frac{y}{r} \Rightarrow \sin^2\theta = \frac{y^2}{r^2}$

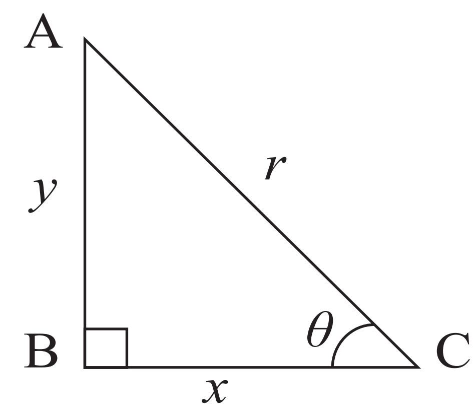
$\sin\theta = \frac{x}{r} \Rightarrow \sin^2\theta = \frac{x^2}{r^2}$

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

$= \frac{y^2}{r^2} + \frac{x^2}{r^2} = \frac{y^2 + x^2}{r^2}$

$= \frac{r^2}{r^2}$ [By Pythagorean theorem]

$= 1$



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

Similarly,

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

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

Identities

$\sin^2\theta + \cos^2\theta = 1$	$\sec^2\theta - \tan^2\theta = 1$	$\operatorname{cosec}^2\theta - \cot^2\theta = 1$
$1 + \cos^2\theta = \sin^2\theta$	$1 + \tan^2\theta = \sec^2\theta$	$1 + \cot^2\theta = \operatorname{cosec}^2\theta$
$1 - \sin^2\theta = son^2\theta$	$\sin^2\theta - 1 = \tan^2\theta$	$\operatorname{cosec}^2\theta - 1 = \cot^2\theta$

Relation among trigonometric ratio's:

$\tan\theta$	$\cot\theta$	$\sec\theta$	$\operatorname{cosec}\theta$
$\frac{\sin\theta}{\cos\theta}$	$\frac{\cos\theta}{\sin\theta}$	$\tan\theta \times \operatorname{cosec}\theta$	$\frac{\sec\theta}{\tan\theta}$
$\frac{1}{\cot\theta}$	$\frac{1}{\tan\theta}$	$\frac{1}{\cos\theta}$	$\frac{1}{\sin\theta}$
$\frac{\sec\theta}{\operatorname{cosec}\theta}$	$\frac{\operatorname{cosec}\theta}{\sec\theta}$	$\frac{\operatorname{cosec}\theta}{\cot\theta}$	$\sec\theta \times \cot\theta$

Trigonometric ratios of standard angles:

Standard Angles (θ)	0°	30°	45°	60°	90°
	0	1	2	3	4
	$\frac{0}{4} = 0$	$\frac{1}{4}$	$\frac{2}{4} = \frac{1}{2}$	$\frac{3}{4}$	$\frac{4}{4} = 1$
$\sin\theta$	$\sqrt{0} = 0$	$\sqrt{\frac{1}{4}} = \frac{1}{2}$	$\sqrt{\frac{1}{2}} = \frac{1}{\sqrt{2}}$	$\sqrt{\frac{3}{4}} = \frac{\sqrt{3}}{2}$	$\sqrt{1} = 1$
$\cos\theta$	1	$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{1}{2}$	0
$\tan\theta$	0	$\frac{1}{\sqrt{3}}$	1	$\sqrt{3}$	Not define
$\cot\theta$	Not define	$\sqrt{3}$	1	$\frac{1}{\sqrt{3}}$	0
$\sec\theta$	1	$\frac{2}{\sqrt{3}}$	$\sqrt{2}$	2	Not define
$\operatorname{cosec}\theta$	Not define	2	$\sqrt{2}$	$\frac{2}{\sqrt{3}}$	1

- Write numbers from 0 to 4.
- Divide all by 4.
- Find square root .
- Write the values in reverse order.
- Use: $\tan\theta = \frac{\sin\theta}{\cos\theta}$
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