2π (radians) $\equiv 360° \equiv 1$ revolution $\quad \theta = \frac{s}{r}$ (radians) $\quad v = \frac{s}{t} \quad \omega = \frac{\theta}{t}$

$$3600\ rev/minute = \frac{3600\ rev}{1\ min}\,\frac{2\pi\ (radians)}{1\ rev}\,\frac{1\ min}{60\ sec} = \frac{120\pi\ (radians)}{1\ sec}$$

$$r = \sqrt{\left(x_2 - x_1\right)^2 + \left(y_2 - y_1\right)^2} \qquad (x-h)^2 + (y-k)^2 = r^2$$

$\sin\theta = \frac{Opposite}{Hypotenuse} = \frac{opp}{hyp}$	$\csc\theta = \frac{hyp}{opp} = \frac{1}{\sin\theta}$
$\cos\theta = \frac{Adjacent}{Hypotenuse} = \frac{adj}{hyp}$	$\sec\theta = \frac{hyp}{adj} = \frac{1}{\cos\theta}$
$\tan\theta = \frac{opposite}{adjacent} = \frac{opp}{adj} = \frac{\sin\theta}{\cos\theta}$	$\cot\theta = \frac{adj}{opp} = \frac{\cos\theta}{\sin\theta} = \frac{1}{\tan\theta}$

Angle θ in degree	Angle θ in radian	sin θ	cos θ	tan θ	cot θ	sec θ	csc θ
0°	0	0	1	0	∞ (undefined)	1	∞ (undefined)
30°	π/6	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{3}}{3}$	$\sqrt{3}$	$\frac{2\sqrt{3}}{3}$	2
45°	π/4	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{2}}{2}$	1	1	$\sqrt{2}$	$\sqrt{2}$
60°	π/3	$\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	$\sqrt{3}$	$\frac{\sqrt{3}}{3}$	2	$\frac{2\sqrt{3}}{3}$
90°	π/2	1	0	± ∞	0	± ∞	1
120°	2π/3	$\frac{\sqrt{3}}{2}$	$-\frac{1}{2}$	$-\sqrt{3}$	$-\frac{\sqrt{3}}{3}$	-2	$\frac{2\sqrt{3}}{3}$
135°	3π/4	$\frac{\sqrt{2}}{2}$	$-\frac{\sqrt{2}}{2}$	-1	-1	$-\sqrt{2}$	$\sqrt{2}$
150°	5π/6	$\frac{1}{2}$	$-\frac{\sqrt{3}}{2}$	$-\frac{\sqrt{3}}{3}$	$-\sqrt{3}$	$-\frac{2\sqrt{3}}{3}$	2
180°	π	0	-1	0	± ∞	-1	± ∞

$\cos^2\alpha + \sin^2\alpha = 1 \qquad 1 + \tan^2\alpha = \sec^2\alpha \qquad 1 + \cot^2\alpha = \csc^2\alpha$

$\cos(-\alpha) = \cos\alpha \qquad \sin(-\alpha) = -\sin\alpha \qquad \tan(-\alpha) = -\tan\alpha$

$\cos(90° - \alpha) = \sin\alpha \qquad \sin(90° - \alpha) = \cos\alpha \qquad \tan(90° - \alpha) = \cot\alpha$

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

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

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

Half-Angle: $\cos\left(\frac{\alpha}{2}\right) = \pm\sqrt{\frac{1+\cos\alpha}{2}} \qquad \sin\left(\frac{\alpha}{2}\right) = \pm\sqrt{\frac{1-\cos\alpha}{2}} \qquad \tan\left(\frac{\alpha}{2}\right) = \frac{\sin\alpha}{1+\cos\alpha} = \frac{1-\cos\alpha}{\sin\alpha}$

Double-Angle

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

Product-to-Sum:

$\sin\alpha\cos\beta = \frac{1}{2}\left[\sin(\alpha+\beta)+\sin(\alpha-\beta)\right]$	$\cos\alpha\sin\beta = \frac{1}{2}\left[\sin(\alpha+\beta)-\sin(\alpha-\beta)\right]$
$\cos\alpha\cos\beta = \frac{1}{2}\left[\cos(\alpha+\beta)+\cos(\alpha-\beta)\right]$	$\sin\alpha\sin\beta = \frac{1}{2}\left[\cos(\alpha-\beta)-\cos(\alpha+\beta)\right]$

Sum-to-Product:

$\cos x+\cos y = 2\cos\left(\frac{x+y}{2}\right)\cos\left(\frac{x-y}{2}\right)$	$\sin x+\sin y = 2\sin\left(\frac{x+y}{2}\right)\cos\left(\frac{x-y}{2}\right)$
$\cos x-\cos y = -2\sin\left(\frac{x+y}{2}\right)\sin\left(\frac{x-y}{2}\right)$	$\sin x-\sin y = 2\cos\left(\frac{x+y}{2}\right)\sin\left(\frac{x-y}{2}\right)$

$a\sin x + b\cos x = k\sin(x+\alpha)$ where $k=\sqrt{a^2+b^2}$, $\sin\alpha = \dfrac{b}{\sqrt{a^2+b^2}}$, and $\cos\alpha = \dfrac{a}{\sqrt{a^2+b^2}}$

$y=\cos^{-1}x$ *iff* $x=\cos y$ where $-1\le x\le 1$ and $0\le y\le\pi$

$y=\sin^{-1}x$ *iff* $x=\sin y$ where $-1\le x\le 1$ and $-\pi/2\le y\le \pi/2$

Law of Sines: $\dfrac{a}{\sin A}=\dfrac{b}{\sin B}=\dfrac{c}{\sin C}$ $\qquad \dfrac{\sin A}{a}=\dfrac{\sin B}{b}=\dfrac{\sin C}{c}$

Law of Cosines: $a^2=b^2+c^2-2bc\cos A$ $\qquad \cos A=\dfrac{b^2+c^2-a^2}{2bc}$

$b^2=a^2+c^2-2ac\cos B$ $\qquad \cos B=\dfrac{a^2+c^2-b^2}{2ac}$

$c^2=a^2+b^2-2ab\cos C$ $\qquad \cos C=\dfrac{a^2+b^2-c^2}{2ab}$

Vectors:

Magnitude: $\lvert V\rvert=\sqrt{a^2+b^2}$	*Angle:* $\cos\theta=\dfrac{U\bullet V}{\lvert U\rvert\lvert V\rvert}$
Dot Product: $U\bullet V=(ai+bj)\bullet(ci+dj)=ac+bd$	

$z=r(\cos\theta+i\sin\theta)=r\,cis\theta$ $\qquad r=\sqrt{x^2+y^2}$ $\qquad \cos\theta=\dfrac{x}{r},\ \sin\theta=\dfrac{y}{r},$ *and* $\tan\theta=\dfrac{y}{x}$