Trigonometry Formula Sheet

$\sin\theta = \cos(90° - \theta)$ $\csc\theta = \sec(90° - \theta)$ $\tan\theta = \cot(90° - \theta)$ $\cos\theta = \sin(90° - \theta)$

$\sec\theta = \csc(90° - \theta)$ $\cot\theta = \tan(90° - \theta)$ $s = r\theta$ $A = \frac{1}{2}r^2\theta$ $\omega = \frac{\theta}{t}$

$v = r\omega$ $s(t) = a\cos\omega t$ $s(t) = a\sin\omega t$ $\cos(A+B) = \cos A\cos B - \sin A\sin B$

$\cos(A-B) = \cos A\cos B + \sin A\sin B$ $\sin(A+B) = \sin A\cos B + \cos A\sin B$

$\sin(A-B) = \sin A\cos B - \cos A\sin B$ $\tan(A+B) = \frac{\tan A + \tan B}{1 - \tan A\tan B}$ $\tan(A-B) = \frac{\tan A - \tan B}{1 + \tan A\tan B}$

$\cos 2A = \cos^2 A - \sin^2 A$ $\cos 2A = 1 - 2\sin^2 A$ $\cos 2A = 2\cos^2 A - 1$ $\sin 2A = 2\sin A\cos A$

$\tan 2A = \frac{2\tan A}{1-\tan^2 A}$ $\cos A\cos B = \frac{1}{2}[\cos(A+B) + \cos(A-B)]$ $\sin A\sin B = \frac{1}{2}[\cos(A-B) - \cos(A+B)]$

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

$\sin A - \sin B = 2\cos\left(\frac{A+B}{2}\right)\sin\left(\frac{A-B}{2}\right)$ $\cos A + \cos B = 2\cos\left(\frac{A+B}{2}\right)\cos\left(\frac{A-B}{2}\right)$ $\cos A - \cos B = -2\sin\left(\frac{A+B}{2}\right)\sin\left(\frac{A-B}{2}\right)$

$\cos\frac{A}{2} = \pm\sqrt{\frac{1+\cos A}{2}}$ $\sin\frac{A}{2} = \pm\sqrt{\frac{1-\cos A}{2}}$ $\tan\frac{A}{2} = \pm\sqrt{\frac{1-\cos A}{1+\cos A}}$ $\tan\frac{A}{2} = \frac{\sin A}{1+\cos A}$

$\tan\frac{A}{2} = \frac{1-\cos A}{\sin A}$ $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$ $Area = \frac{1}{2}bc\sin A$ $Area = \frac{1}{2}ab\sin C$

$Area = \frac{1}{2}ac\sin B$ $a^2 = b^2 + c^2 - 2bc\cos A$ $b^2 = a^2 + c^2 - 2ac\cos B$ $c^2 = a^2 + b^2 - 2ab\cos C$

$Area = \sqrt{s(s-a)(s-b)(s-c)}$, where $s = \frac{1}{2}(a+b+c)$ $|\vec{u}| = \sqrt{a^2+b^2}$ $a = |\vec{u}|\cos\theta$ $b = |\vec{u}|\sin\theta$

$\vec{u}\cdot\vec{v} = ac + bd$ $\vec{u}\cdot\vec{v} = |\vec{u}||\vec{v}|\cos\theta$ $\cos\theta = \frac{\vec{u}\cdot\vec{v}}{|\vec{u}||\vec{v}|}$ $x = r\cos\theta$ $y = r\sin\theta$ $r = \sqrt{x^2+y^2}$

$\tan\theta = \frac{y}{x}$ $x + yi = r(\cos\theta + i\sin\theta) = r cis\theta$ $(r_1 cis\theta_1)(r_2 cis\theta_2) = r_1 r_2 cis(\theta_1 + \theta_2)$

$\frac{r_1 cis\theta_1}{r_2 cis\theta_2} = \frac{r_1}{r_2}cis(\theta_1 - \theta_2)$ $[r cis\theta]^n = r^n(cis\, n\theta)$

$\sqrt[n]{r} cis\alpha$, where $\alpha = \frac{\theta + 360°\cdot k}{n}$ for k = 0, 1, 2, …, n – 1