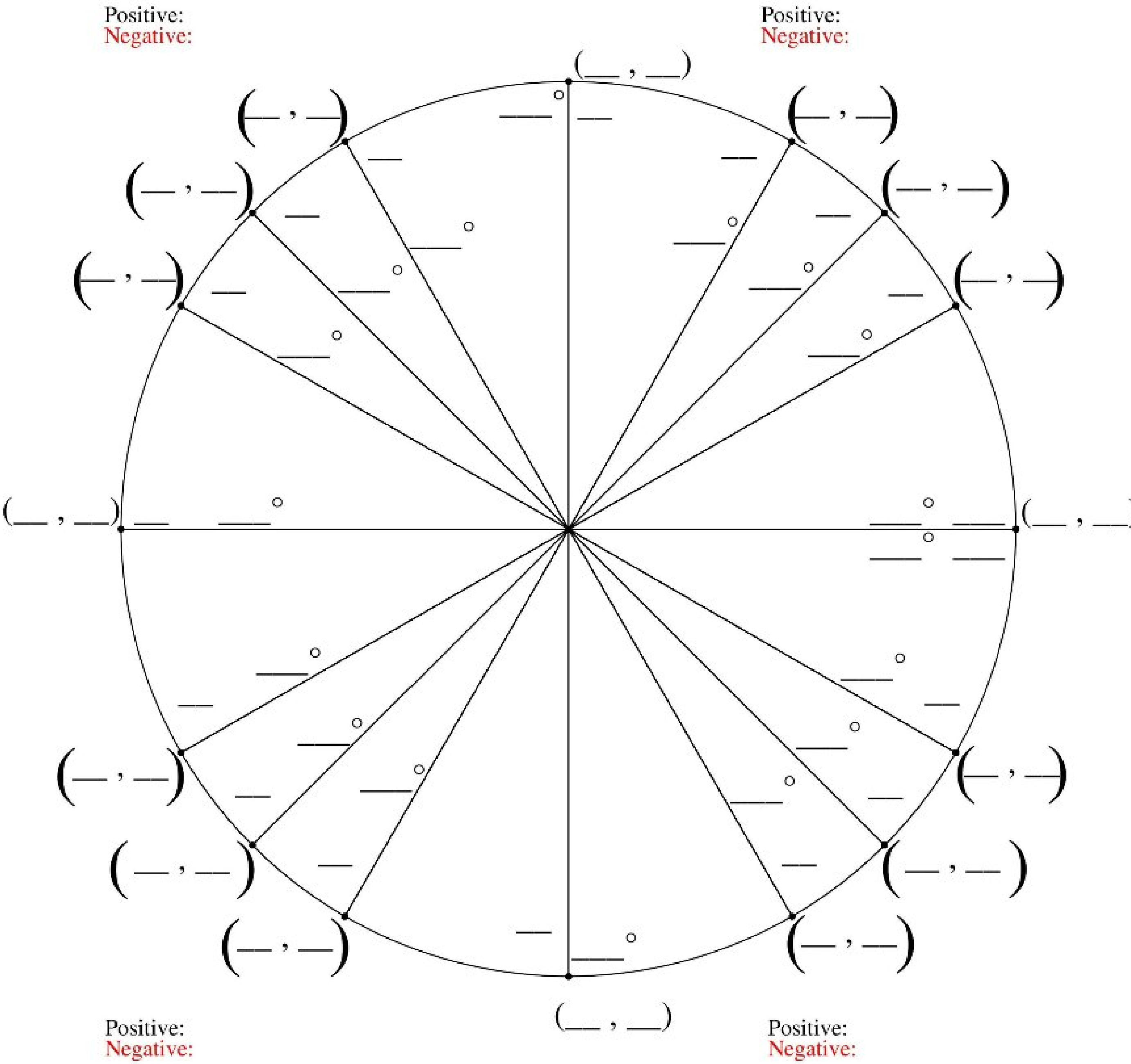
Trig Formulas



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Trig Formulas

$s = r\theta$ $\quad A = \frac{1}{2}r^2\theta$ $\quad v = \frac{s}{t} = r\omega$ $\quad \omega = \frac{\theta}{t} = \frac{v}{r}$

$\cos\left(\frac{\theta}{2}\right) = \pm\sqrt{\frac{1+\cos(\theta)}{2}}$ $\quad \sin\left(\frac{\theta}{2}\right) = \pm\sqrt{\frac{1-\cos(\theta)}{2}}$ $\quad \tan\left(\frac{\theta}{2}\right) = \pm\sqrt{\frac{1-\cos(\theta)}{1+\cos(\theta)}} = \frac{1-\cos(\theta)}{\sin(\theta)}$

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

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

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

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

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

$\cos(\alpha) + \cos(\beta) = 2\cos\left(\frac{\alpha+\beta}{2}\right)\cdot\cos\left(\frac{\alpha-\beta}{2}\right)$

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

$\text{Area} = \frac{1}{2}ab\sin(C)$ $\quad \text{Area} = \sqrt{s(s-a)(s-b)(s-c)}, \quad s = \frac{1}{2}(a+b+c)$

$z = r(\cos(\theta) + i\sin(\theta))$ or $z = r\cos(\theta) + r\sin(\theta)i$

$z_1 z_2 = r_1 r_2[\cos(\theta_1+\theta_2) + i\sin(\theta_1+\theta_2)]$ $\quad \frac{z_1}{z_2} = \frac{r_1}{r_2}[\cos(\theta_1-\theta_2) + i\sin(\theta_1-\theta_2)]$

$z^n = r^n[\cos(n\theta) + i\sin(n\theta)]$, where $n \geq 1$ is a positive integer

$\sqrt[n]{z} = \sqrt[n]{r}\left[\cos\left(\frac{\theta_0 + 2\pi k}{n}\right) + i\sin\left(\frac{\theta_0 + 2\pi k}{n}\right)\right]$, $n \geq 2$ is an integer, $k = 0, 1, 2, \ldots, n-1$

$\vec{v} = \|\vec{v}\|(\cos(\alpha)\hat{i} + \sin(\alpha)\hat{j})$ $\quad \cos(\theta) = \frac{\vec{u}\bullet\vec{v}}{\|\vec{u}\|\,\|\vec{v}\|}$ $\quad \vec{v}_1 = \frac{\vec{v}\bullet\vec{w}}{\|\vec{w}\|^2}\vec{w}, \quad \vec{v}_2 = \vec{v} - \vec{v}_1$