C12 - 0.0 - Formula Sheet

Transformations $y = af\big(b(x-h)\big)+k$

Radicals $\sqrt{x-c}$ $x \geq c$

Polynomials $y = a(x-z)^1(x-r)^2(x-s)^3 \ldots$

$$\frac{P(x)}{x-a} = Q(x) + \frac{R}{x-a}$$

$$a\,\big|\,\text{Synthetic} = f(a) = x - int\,(a,0)$$
$$R = 0 \qquad Factor = (x-a)$$

Trigonometry $\pi = 180^0$ $x^2+y^2 = 1^2$ $(cosx, sinx)$

$$p = \frac{2^*\pi}{|b|}$$

$sin\theta = y$ $cos\theta = x$ $tan\theta = \frac{y}{x}$

$csc\theta = \frac{H}{O}$ $sec\theta = \frac{H}{A}$ $cot\theta = \frac{A}{O}$ $\theta_r^* = \sin^{-1}(+\frac{O}{H})$ $\theta_{gen} = \theta_{stp} \pm p^* n, n \in I$

Pythagorean Identities $\sin^2\theta + \cos^2\theta = 1$ $1 + \tan^2\theta = \sec^2\theta$ $1 + \cot^2\theta = \csc^2\theta$

Reciprocal and Quotient Identities

$sec\theta = \frac{1}{cos\theta}$ $csc\theta = \frac{1}{sin\theta}$ $cot\theta = \frac{1}{tan\theta}$ $tan\theta = \frac{sin\theta}{cos\theta}$ $\boxed{cot\theta = \frac{cos\theta}{sin\theta}}$

Addition Identities

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

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

Double Angle Identities

$$cos2\theta = \cos^2\theta - \sin^2\theta$$
$$= 2\cos^2\theta - 1$$
$$= 1 - 2\sin^2\theta$$

$$sin2\theta = 2sin\theta cos\theta$$

Arc Length/Sector Area

$a = \theta r$ $A = \frac{ar}{2}$ $A = \frac{\theta r^2}{2}$

$\tan(\alpha+\beta) = \frac{tan\alpha + tan\beta}{1 - tan\alpha\, tan\beta}$ $\tan(\alpha-\beta) = \frac{tan\alpha - tan\beta}{1 + tan\alpha\, tan\beta}$ $\tan 2\theta = \frac{2\tan\theta}{1-\tan^2\theta}$

Exponentials $F = P(1 \pm r)^t$ $F = P\left(1 \pm \frac{r}{n}\right)^{tn}$ $F = P(r)^{\frac{t}{T}}$ $F = Pe^{kt}$ $I = 10^{b-s}$

Logarithms $\log_b a = c$ $a = b^c$ $a > 0, b > 0, b \neq 1$ $log\, a^m = mloga$ $\log_b a = \frac{loga}{log\, b}$ $log\, m + log\, n = log\, mn$ $log\, m - log\, n = log\frac{m}{n}$

Rationals $VA \neq 0$ $y = \frac{a}{VA} + HA$ $y = \frac{ax^m}{bx^n}$ $y = \frac{a(HA)}{(HA)}\frac{(x-int)(holes)}{(VA's)(holes)}$ $y = Asymptote + \frac{R}{Divisor}$

Combinatorics ${}_nP_r = \frac{n!}{(n-r)!}$ ${}_nC_r = \frac{n!}{r!\,(n-r)!}$ $(a+b)^n$ $t_{k+1} = {}_nC_k a^{n-k} b^k$