

Formulas to Remember:

$$a^n a^m = a^{m+n}$$

$$\frac{a^m}{a^n} = a^{m-n}$$

$$(a^m)^n = a^{m+n}$$

$$a^{-m} = \frac{1}{a^m}$$

$$a^0 = 1$$

$$\sqrt{ab} = \sqrt{a}\sqrt{b}$$

$$\frac{\sqrt{a}}{\sqrt{b}} = \sqrt{\frac{a}{b}}$$

$$\sqrt{a+b} \neq \sqrt{a} + \sqrt{b}$$

$$\sqrt[m]{x^n} = x^{\frac{n}{m}}$$

$$a^2 - b^2 = (a+b)(a-b)$$

$$a^3 - b^3 = (a-b)(a^2 + ab + b^2)$$

$$a^3 + b^3 = (a+b)(a^2 - ab + b^2)$$

$$(a+b)^2 = a^2 + 2ab + b^2$$

$$\sqrt{-1} = i$$

$$i^2 = -1$$

$$a \pm bi$$

$$ax^2 + bx + c = 0$$

$$a(x-h)^2 + k = 0$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-b}{2a}$$

$$ax + by = c$$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$y - y_1 = m(x - x_1)$$

$$y = mx + b$$

$$m_1 = m_2 \text{ parallel}$$

$$m_1 m_2 = -1 \text{ perpendicular}$$

$$y = kx$$

$$y = \frac{k}{x}$$

$$f(-x) = f(x)$$

$$f(-x) = -f(x)$$

$$3^x = 9 \longrightarrow \log_3 9 = x$$

$$\log_2 3 = \frac{\log 3}{\log 2}$$

$$\log_e = \ln$$

$$\log xy = \log x + \log y$$

$$\log \frac{x}{y} = \log x - \log y$$

$$A = P \left(1 + \frac{r}{n} \right)^{nt}$$

$$\log x^y = y \log x$$

$$A = Pe^{nt}$$

$$(x-h)^2 + (y-k)^2 = r^2$$

$$\frac{(x-h)^2}{a^2} + \frac{(y-k)^2}{b^2} = 1$$

$$b^2 = a^2 - c^2$$

$$\frac{(x-h)^2}{a^2} - \frac{(y-k)^2}{b^2} = 1$$

$$\frac{(y-k)^2}{b^2} - \frac{(x-h)^2}{a^2} = 1$$

$$c^2 = a^2 + b^2$$

$$y = \pm \frac{a}{b} x, \quad y = \pm \frac{b}{a} x$$

$$x^2 = 4 p y$$

$$y^2 = 4 p x$$

$$(x-h)^2 = 4 p (y-k)$$

$$(y-k)^2 = 4 p (x-h)$$

$$x = \frac{D_x}{D}, y = \frac{D_y}{D}, z = \frac{D_z}{D} \quad \begin{vmatrix} x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \\ x_3 & y_3 & 1 \end{vmatrix} = 0 \text{ collinearity}$$

$$\pm \frac{1}{2} \begin{vmatrix} x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \\ x_3 & y_3 & 1 \end{vmatrix} = A \quad \begin{vmatrix} x & y & 1 \\ x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \end{vmatrix} = 0$$

$$a_n = a_1 + (n - 1) d$$

$$S = n \left(\frac{a_1 + a_2}{2} \right)$$

$$a_n = a_1 r^{n-1}$$

$$S_n = \frac{a(1 - r^n)}{1 - r}$$

$$S_\infty = \frac{a_1}{1 - n}$$

$${}_n P_n = \frac{n!}{(n-r)!}$$

$$0! = 1$$

$$1! = 1$$

$$\frac{{}_n P_n}{p!q!r!} = \frac{n!}{p!q!r!}$$

$${}_n C_r = \frac{{}_n P_r}{r!} \quad (a+b)^n = \sum_{r=0}^n \frac{n!}{r!(n-r)!} a^{n-1} b^r$$

$${}_n P_r = \frac{n!}{(n-r)!}$$