

Formulas for Math 154 Final

$$ax^2 + bx + c = 0 \quad x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \quad a^2 + b^2 = c^2$$

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} \quad M\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$$

$$\log_a x = y \quad a^y = x \quad S = \frac{a_1}{1-r} \quad S_n = \frac{a_1(1-r^n)}{1-r} \quad a_n = a_1 r^{n-1}$$

$$S_n = \frac{n}{2}(a_1 + a_n) \quad a_n = a_1 + (n-1)d$$

$$f(x) = k \quad y = mx + b \quad y = a(x-h)^2 + k \quad (x-h)^2 + (y-k)^2 = r^2$$

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

$$\log_a(MN) = \log_a M + \log_a N \quad \log_a\left(\frac{M}{N}\right) = \log_a M - \log_a N$$

$$\log_a(M^N) = N \cdot \log_a M \quad \log_a M = \frac{\log_b M}{\log_b a}$$

$$(a+b)^n = \sum_{i=0}^n \binom{n}{i} a^{n-i} b^i \quad \binom{n}{i} = \frac{n!}{(n-i)!i!} \quad r^{\text{th}} = \binom{n}{r-1} a^{n-(r-1)} b^{(r-1)}$$