Mathematics 30-2 Formula Sheet

Relations and Functions

Graphing Calculator Window Format

$$x:\left[x_{\min},x_{\max},x_{\text{scl}}\right]$$
$$y:\left[y_{\min},y_{\max},y_{\text{scl}}\right]$$

Exponents and Logarithms

$$y = a^x \longleftrightarrow x = \log_a y$$
$$\log_b c = \frac{\log_a c}{\log_a b}$$

Laws of Logarithms

$$\log_a(M \cdot N) = \log_a M + \log_a N$$
$$\log_a\left(\frac{M}{N}\right) = \log_a M - \log_a N$$
$$\log_a(M^n) = n\log_a M$$

Exponential functions

$$y = a \cdot b^x$$

Sinusoidal functions

$$y = a \cdot \sin(bx + c) + d$$
$$\text{Period} = \frac{2\pi}{b}$$

Quadratic equations

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

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

Probability

$$n! = n(n-1)(n-2)\ldots 3 \cdot 2 \cdot 1,$$
$$\text{where } n \in N \text{ and } 0! = 1$$

$${}_nP_r = \frac{n!}{(n-r)!}$$
$${}_nC_r = \frac{n!}{(n-r)!r!}$$
$${}_nC_r = \binom{n}{r}$$

$$P(A \cup B) = P(A) + P(B)$$
$$P(A \cup B) = P(A) + P(B) - P(A \cap B)$$
$$P(A \cap B) = P(A) \cdot P(B)$$
$$P(A \cap B) = P(A) \cdot P(B \mid A)$$

Logical Reasoning

A' Complement
$\varnothing$ Empty set
$\cap$ Intersection
$\subset$ Subset
$\cup$ Union