

# Mathematics 30–2 Formula Sheet

## Relations and Functions

*Graphing Calculator Window Format*

$$x: [x_{\min}, x_{\max}, x_{\text{scl}}]$$

$$y: [y_{\min}, y_{\max}, y_{\text{scl}}]$$

*Exponents and Logarithms*

$$y = a^x \leftrightarrow x = \log_a y$$

$$\log_b c = \frac{\log_a c}{\log_a b}$$

*Laws of Logarithms*

$$\log_b(M \cdot N) = \log_b M + \log_b N$$

$$\log_b\left(\frac{M}{N}\right) = \log_b M - \log_b N$$

$$\log_b(M^n) = n \log_b M$$

*Exponential functions*

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

*Logarithmic functions*

$$y = a + b \cdot \ln x$$

*Sinusoidal functions*

$$y = a \cdot \sin(bx + c) + d$$

$$\text{Period} = \frac{2\pi}{b}$$

*Quadratic equations*

$$\text{For } ax^2 + bx + c = 0$$

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

## Probability

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

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

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

$${}_n C_r = \binom{n}{r}$$

$$P(A \cup B) = P(A) + P(B)$$

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

$$P(A \cap B) = P(A) \cdot P(B)$$

$$P(A \cap B) = P(A) \cdot P(B | A)$$

## Logical Reasoning

$A'$  Complement

$\emptyset$  Empty set

$\cap$  Intersection

$\subset$  Subset

$\cup$  Union