

# Intermediate Algebra Formula Sheet

Intermediate Algebra ~ Prof. Sally J. Keely, M.S.

<p><b>Factoring Formulae:</b> Note that F=First, L=Last as a mnemonic.</p> <p>Perfect Square Trinomials: <math>F^2 \pm 2FL + L^2 = (F \pm L)^2</math></p> <p>Difference of Squares: <math>F^2 - L^2 = (F - L)(F + L)</math></p> <p>Sum of Squares: <math>F^2 + L^2 = (F - L \cdot i)(F + L \cdot i)</math> (Factorable in <math>\mathbb{C}</math>omplex realm only; prime in <math>\mathbb{R}</math>eals. <math>i</math>=imaginary number)</p> <p>Difference of Cubes: <math>F^3 - L^3 = (F - L)(F^2 + FL + L^2)</math></p> <p>Sum of Cubes: <math>F^3 + L^3 = (F + L)(F^2 - FL + L^2)</math></p>	
<p><b>Quadratic Formula:</b></p> $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ <p>Discriminant: <math>D = b^2 - 4ac</math></p>	<p><b>Equations &amp; Vertex of a Parabola:</b></p> $y = a(x - h)^2 + k \Rightarrow V = (h, k)$ $y = ax^2 + bx + c \Rightarrow V_x = \frac{-b}{2a}$ <p>(Plug <math>V_x</math> in for <math>x</math> to find <math>y</math>-coordinate of <math>V</math>)</p>
<p><b>Rules of Logarithms:</b></p> $\log_b(MN) = \log_b M + \log_b N$ $\log_b\left(\frac{M}{N}\right) = \log_b M - \log_b N$ $\log_b(M^p) = p \cdot \log_b M$	<p><b>Pythagorean Theorem:</b></p> $a^2 + b^2 = c^2 \quad (c \text{ is the hypotenuse})$ <p><b>Change of Base Theorem:</b></p> $\log_b x = \frac{\log x}{\log b} = \frac{\ln x}{\ln b}$