

General Algebra Formulas to be MEMORIZED

Intermediate Algebra ~ Prof. Sally Keely

Factoring

Note that F=First, L=Last as a mnemonic.

Difference of Squares:

$$F^2 - L^2 = (F - L)(F + L)$$

Perfect Square Trinomials:

$$F^2 + 2FL + L^2 = (F + L)^2$$

$$F^2 - 2FL + L^2 = (F - L)^2$$

Quadratic Equations

Zero-Product Rule: $A \cdot B = 0 \Rightarrow A = 0 \text{ or } B = 0$

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

Pythagorean Theorem

$$a^2 + b^2 = c^2 \quad (c \text{ is the hypotenuse})$$

Vertex of a Parabola

$$y = a(x - h)^2 + k \Rightarrow V = (h, k)$$

$$y = ax^2 + bx + c \Rightarrow V_x = \frac{-b}{2a}$$

(Plug V_x in for x to find y -coordinate of V)

Logarithms

Basic Properties: $\log_b(b) = 1$ and $\log_b(1) = 0$

Undo Properties: $\log_b(b^x) = x$ and $b^{\log_b(x)} = x$

General Algebra Formulas to be PROVIDED on exams

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Note that F=First, L=Last as a mnemonic.

$$\text{Difference of Cubes: } F^3 - L^3 = (F - L)(F^2 + FL + L^2)$$

$$\text{Sum of Cubes: } F^3 + L^3 = (F + L)(F^2 - FL + L^2)$$

Interest

$$\text{Simple: } A = P + Prt$$

$$\text{Compound: } A = P \left(1 + \frac{r}{k} \right)^{kt}$$

$$\text{Continuously Compounded: } A = Pe^{rt}$$

$$\text{Doubling Time: } t = \ln 2 / r$$

Distance & Midpoint

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

Fractional Exponent to Radical

$$b^{\frac{m}{n}} = \sqrt[n]{b^m} = \left(\sqrt[n]{b} \right)^m$$

Logarithms

$$\text{Product Rule: } \log_b(MN) = \log_b M + \log_b N$$

$$\text{Quotient Rule: } \log_b \left(\frac{M}{N} \right) = \log_b M - \log_b N$$

$$\text{Power Rule: } \log_b(M^p) = p \cdot \log_b M$$

$$\text{Change of Base Theorem: } \log_b x = \frac{\log x}{\log b} = \frac{\ln x}{\ln b}$$