

**Properties of Exponents**

$$a^m a^n = a^{m+n} \quad (a^m b^n)^p = a^{mp} b^{np} \quad \frac{a^m}{a^n} = a^{m-n}$$

$$\left(\frac{a^m}{b^n}\right)^p = \frac{a^{mp}}{b^{np}} \quad (a^m)^n = a^{mn} \quad b^{-p} = \frac{1}{b^p}$$

$$\left(\frac{1}{b}\right)^{-p} = b^p \quad \left(\frac{a}{b}\right)^{-p} = \left(\frac{b}{a}\right)^p \quad b^0 = 1$$

**Quadratic Equation**

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

**Properties of Radicals**

$$(\sqrt[n]{a})^m = \sqrt[n]{a^m} = a^{m/n} \quad \sqrt[n]{a} \sqrt[n]{b} = \sqrt[n]{ab} \quad \frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}} \quad \sqrt[m]{\sqrt[n]{a}} = \sqrt[mn]{a}$$

**Rectangle**

$$P = 2W + 2L$$

$$A = LW$$

**Cube**

$$V = s^3$$

**Uniform Motion**

$$d = rt \quad r = \frac{d}{t} \quad t = \frac{d}{r}$$

**Lines**

**Slope**

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

**Point-Slope**

$$y - y_1 = m(x - x_1)$$

**Slope-Intercept**

$$y = mx + b$$

**Standard Form**

$$Ax + By = C$$

**Factoring**

Difference of Two Squares:  $a^2 - b^2 = (a + b)(a - b)$

Sum of Two Cubes:  $a^3 + b^3 = (a + b)(a^2 - ab + b^2)$

Difference of Two Cubes:  $a^3 - b^3 = (a - b)(a^2 + ab + b^2)$

Perfect Square Trinomials:  $a^2 + 2ab + b^2 = (a + b)^2$        $a^2 - 2ab + b^2 = (a - b)^2$

**Variation**

Direct:  $y = kx$

Inverse:  $y = \frac{k}{x}$