

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

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

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