College Algebra and College Algebra with Review Final Review

Distance Formula

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

Midpoint Formula

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

Circles

$$(x - h)^2 + (y - k)^2 = r^2$$

Where (h, k) is the center and r is the radius

Properties of Logarithms

$$\log_b(b^p) = p$$

$$b^{\log_b(p)} = p$$

$$\log_b(b) = 1$$

$$\log_b(1) = 0$$

$$\ln(x) = \log_e(x)$$

$$y = \log_b(x) \text{ if and only if } b^y = x$$

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

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

$$\log_b(M^p) = p \cdot \log_b(M)$$

$$\log(x) = \log_{10}(x)$$

Change-of-Base Rule

$$\log_b(x) = \frac{\log(x)}{\log(b)}$$

$$or \ \log_b(x) = \frac{\ln(x)}{\ln(b)}$$

Lines

Slope

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

Point-Slope Form

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

Slope-Intercept Form

$$y = mx + b$$

Compound Interest

Compounded n times per year

$$A = P \cdot \left(1 + \frac{r}{n}\right)^{nt}$$

A = Amount after t years
n = number of times compounded per year
r = yearly interest rate (as a decimal)

Compounded Continuously

$$A = P \cdot e^{rt}$$

P = Principal (original amount)
e = base of the natural log
t = number of years

Quadratic Formula

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

Vertex of a Parabola

(h, k) where $h = \frac{-b}{2a}$ and k = f(h)

Properties of Absolute Value

If k > 0, then | ax + b | = k is equivalent to ax + b = k or ax + b = −k.
If k > 0, then | ax + b | > k is equivalent to ax + b > k or ax + b < −k.
If k > 0, then | ax + b | < k is equivalent to −k < ax + b < k.
The two properties above also hold for ≤ and ≥

Properties of Polynomial Equations

If a polynomial P(x) is divided by x − r, the remainder is P(r).
If P(r) = 0, then x − r is a factor of P(x).   If x − r is a factor of P(x), then P(r) = 0.

Even and Odd Functions

Even Function: (y-Axis Symmetry)   f(-x) = f(x)
Odd Function: (Origin Symmetry)   f(-x) = -f(x)