

College Algebra and College Algebra with Review Formulas

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
 $\log_b(b^p) = p$ $y = \log_b(x)$ if and only if $b^y = x$

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

$\log_b(b) = 1$ $\log_b(M \cdot N) = \log_b(M) + \log_b(N)$
 $\log_b(1) = 0$ $\log_b(M^p) = p \cdot \log_b(M)$
 $\ln(x) = \log_e(x)$ $\log(x) = \log_{10}(x)$

Change of Base Formula
 $\log_b(x) = \frac{\ln(x)}{\ln(b)}$
 or $\log_b(x) = \frac{\log(x)}{\log(b)}$

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

Lines
Point-Slope form
 $y - y_1 = m(x - x_1)$

Slope-Intercept form
 $y = mx + b$

Interest

Simple $I = P \cdot r \cdot t$	Compounded n times per year $A = P \cdot \left(1 + \frac{r}{n}\right)^{n \cdot t}$	Compounded Continuously $A = P \cdot e^{r \cdot t}$
$I = \text{Interest}$	$n = \text{number of times compounded per year}$	$e = \text{base of the natural log}$
$P = \text{Principal (original amount)}$	$r = \text{nominal interest rate}$	$t = \text{number of years}$

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

Vertex of a Parabola
 $\left(\frac{-b}{2a}, f\left(\frac{-b}{2a}\right) \right)$

Properties of Absolute Value Inequalities

$ x < c$	$(c \geq 0)$	if and only if	$-c < x < c$
$ x > c$	$(c \geq 0)$	if and only if	either $x > c$ or $x < -c$

Possible Rational Zeros = $\frac{\text{factors of constant term}}{\text{factors of leading coefficient}} = \pm \frac{p}{q}$

Remainder Theorem: If a polynomial $f(x)$ is divided by $x - k$, the remainder is $r = f(k)$.

Factor Theorem: A polynomial $f(x)$ has a factor $(x - k)$ if and only if $f(k) = 0$.