Algebra 2 B Formulas

Quadratic Formula: If $ax^2 + bx + c = 0$, then $x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$.

Factoring: $a^3 + b^3 = (a+b)(a^2 - ab + b^2)$ $a^3 - b^3 = (a-b)(a^2 + ab + b^2)$

Compound Interest:

Continuously: $A = Pe^{rt}$ n times per year: $A = P\left(1 + \dfrac{r}{n}\right)^{nt}$

Arithmetic Sequence and Series:

$a_n = a_1 + (n-1)d$ $S_n = n\left(\dfrac{a_1 + a_n}{2}\right) = n\left(\dfrac{2a_1 + (n-1)d}{2}\right)$

Geometric Sequence and Series:

$a_n = a_1 r^{n-1}$ $S_n = a_1\left(\dfrac{1 - r^n}{1 - r}\right)$

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Conic Sections

Circle	$x^2 + y^2 = r^2$	Center $(0,0)$	radius r
Parabola	$x^2 = 4py$ or $y = \frac{1}{4p}x^2$ opens up if $p > 0$, opens down if $p < 0$	Vertex $(0,0)$	
	$y^2 = 4px$ or $x = \frac{1}{4p}y^2$ opens right if $p > 0$, opens left if $p < 0$	Vertex $(0,0)$	
	p is the distance from the vertex to the focus and from the vertex to the directrix		
Ellipse	$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ major axis horizontal	Center $(0,0)$	$a > b$
	$\frac{x^2}{b^2} + \frac{y^2}{a^2} = 1$ major axis vertical	Center $(0,0)$	$a > b$
	$a =$ center to vertex, $c =$ center to focus	$c^2 = a^2 - b^2$	
Hyperbola	$\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ transverse axis horizontal	Center $(0,0)$	
	$\frac{y^2}{a^2} - \frac{x^2}{b^2} = 1$ transverse axis vertical	Center $(0,0)$	
	$a =$ center to vertex $c =$ center to focus	$c^2 = a^2 + b^2$	