## Algebra II Formula Sheet

Formulas that you may need to solve questions on this exam are found below.
You may use calculator $\pi$ or the number 3.14.


## Data Analysis

Permutation: $\quad{ }_{n} P_{r}=\frac{n!}{(n-r)!}$
Combination: $\quad{ }_{n} C_{r}=\frac{n!}{r!(n-r)!}$

## Exponential Properties

$a^{m} \cdot a^{n}=a^{m+n}$
$\left(a^{m}\right)^{n}=a^{m \cdot n}$
$\frac{a^{m}}{a^{n}}=a^{m-n}$
$a^{-1}=\frac{1}{a}$

Powers of the Imaginary Unit

$$
\begin{array}{ll}
i=\sqrt{-1} & i^{2}=-1 \\
i^{3}={ }^{-} i & i^{4}=1
\end{array}
$$

## Logarithmic Properties

$\log _{a} x=y \leftrightarrow x=a^{y} \quad \log x=y \leftrightarrow x=10^{y} \quad \ln x=y \leftrightarrow x=e^{y}$
$\log _{a}(x \cdot y)=\log _{a} x+\log _{a} y$
$\log _{a} x^{p}=p \cdot \log _{a} x$
$\log _{a} \frac{x}{y}=\log _{a} x-\log _{a} y$

## Quadratic Functions

General Formula: $\quad f(x)=a x^{2}+b x+c$

Standard (Vertex) Form: $\quad f(x)=a(x-h)^{2}+k$

Factored Form: $\quad f(x)=a\left(x-x_{1}\right)\left(x-x_{2}\right)$
Quadratic Formula: $\quad x=\frac{-b \pm \sqrt{b^{2}-4 a c}}{2 a}$

$$
\text { when } a x^{2}+b x+c=0 \text { and } a \neq 0
$$

## Compound Interest Equations

Annual: $\quad A=P(1+r)^{t} \quad A=$ account total after $t$ years
Periodic: $A=P\left(1+\frac{r}{n}\right)^{n t} \quad \begin{array}{ll}P=\text { principal amount } \\ r=\text { annual rate of interest }\end{array}$
$t=$ time (years)
Continuous: $\quad A=P e^{r t}$
$n=$ number of periods interest is compounded per year

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