# Algebra II Formula Sheet 2016 Mathematics Standards of Learning 

## Geometric Formulas:


$A=\frac{1}{2} b h$

$p=2 l+2 w$
$A=l w$

$a^{2}+b^{2}=c^{2}$

## Quadratic Formula:

$$
x=\frac{-b \pm \sqrt{b^{2}-4 a c}}{2 a}, \text { where } a x^{2}+b x+c=0 \text { and } a \neq 0
$$

## Statistics Formulas:

Given:
$x$ represents an element of the data set,
$x_{i}$ represents the $i^{\text {th }}$ element of the data set,
$n$ represents the number of elements in the data set,
$\mu$ represents the mean of the data set,
$\sigma$ represents the standard deviation of the data set, and
$\sigma^{2}$ represents the variance of the data set
z-score: $\quad z=\frac{x-\mu}{\sigma}$
standard deviation: $\sigma=\sqrt{\frac{\sum_{i=1}^{n}\left(x_{i}-\mu\right)^{2}}{n}}$
variance $\left(\sigma^{2}\right)=\frac{\sum_{i=1}^{n}\left(x_{i}-\mu\right)^{2}}{n}$

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## Sequence and Series Formulas:

Given:
$a_{n}$ represents the value of $n^{\text {th }}$ term
$S_{n}$ represents the sum of first $n$ terms
$S_{\infty}$ represents the sum of an infinite geometric series
$r$ represents the common ratio
$d$ represents the common difference

## Arithmetic

$a_{n}=a_{1}+(n-1) d$
$a_{n}=a_{n-1}+d$
$S_{n}=\frac{n}{2}\left(a_{1}+a_{n}\right)$
$S_{n}=\frac{n}{2}\left[2 a_{1}+(n-1) d\right]$

## Geometric

$$
a_{n}=a_{1} r^{n-1}
$$

$$
a_{n}=a_{n-1} \cdot r
$$

$$
S_{n}=\frac{a_{1}\left(1-r^{n}\right)}{(1-r)}, r \neq 1
$$

$$
S_{\infty}=\frac{a_{1}}{(1-r)},|r|<1
$$

## Permutations and

## Combinations Formulas:

If $n$ and $r$ are positive integers and $n \geq r$,

$$
\begin{aligned}
& n^{P_{r}}=\frac{n!}{(n-r)!} \\
& n^{C} r=\frac{n!}{r!(n-r)!}
\end{aligned}
$$

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