Chapter 11: Sequences and Series

	Arithmetic	**Note:**
Sequence	$t_n = t_1 + (n-1)d$	Arithmetic Sequence
Series (Find the sum)	$s_n = \frac{n(t_1 + t_n)}{2}$	When you know the first and last term.
	$s_n = \frac{n}{2}\left[2t_1 + (n-1)d\right]$	When you know the first term and the common difference.
	Geometric	**Note:**
Sequence	$t_n = t_1 \bullet r^{n-1}$	Geometric Sequence
Series (Find the sum)	$s_n = \frac{t_1(1-r^n)}{1-r}$	A finite Geometric Series (a limited number of terms, or Partial Sum)
	$S = \frac{t_1}{1-r}$	An **infinite** Geometric Series, if our infinite series is convergent ($\lvert \boldsymbol{r} \rvert < 1$)

Binomial Expansion

To find all terms in a Binomial Expansion, use:

$$(a+b)^n =$$

$${}_nC_0a^n + {}_nC_1a^{n-1}b + {}_nC_2a^{n-2}b^2 + {}_nC_3a^{n-3}b^3 + \ldots + {}_nC_nb^n$$

To find the $\boldsymbol{r}^{th}$ term of a binomial expansion raised to the $\boldsymbol{n}^{th}$ power, use the following formula:

$$\left({}_nC_{r-1}\right)a^{(n-r+1)}b^{(r-1)}$$

$$\binom{n}{r} = {}_nC_r = \frac{n!}{(n-r)!r!}$$