College Algebra
Formula Sheet for Test 5

Binomial Theorem

$$\left[(1^{st}\,term)+(2^{nd}\,term)\right]^n=(1^{st})^n+({}_nC_1)(1^{st})^{n-1}(2^{nd})^1+({}_nC_2)(1^{st})^{n-2}(2^{nd})^2+.....$$
$$+({}_nC_{n-1})(1^{st})^1(2^{nd})^{n-1}+(2^{nd})^n$$
rth term : $({}_nC_{r-1})(1^{st})^{n-(r-1)}(2^{nd})^{r-1}$

Sequences

Arithmetic: Explicit $\rightarrow\ a_n=a_1+(n-1)d$

Recursion $\rightarrow a_n=a_{n-1}+d$

Geometric: Explicit $\rightarrow a_n=a_1(r^{n-1})$

Recursion $\rightarrow a_n=(a_{n-1})r$

Series

Recursion $\rightarrow S_n=S_{n-1}+a_n$

Arithmetic: Explicit $\rightarrow S_n=(\frac{n}{2})(a_1+a_n)$

$$S_n=(\frac{n}{2})[2a_1+(n-1)d]$$

Geometric: Explicit $\rightarrow S_n=\frac{a_1(1-r^n)}{1-r},\quad 1\neq r$

$$S_n=\frac{a_1-(a_n)r}{1-r},\quad 1\neq r$$

Infinite Geometric : $S_\infty=\frac{a_1}{1-r},\quad |r|<1$