

- 1) General Term of an Arithmetic Sequence 1) \_\_\_\_\_  
 The  $n$ th term of an arithmetic sequence with first term  $a_1$  and common difference  $d$  is  $a_n = a_1 + (n - 1)d$ .
  
- 2) The Sum of the First  $n$  Term of an Arithmetic Sequence 2) \_\_\_\_\_  
 The sum,  $S_n$ , of the first  $n$  terms of an arithmetic sequence is given by  

$$S_n = \frac{n}{2}(a_1 + a_n).$$
  
- 3) The number of even positive integers between any two positive odd integers  $a$  and  $b$  is  $n = \frac{b - a}{2}$ . 3) \_\_\_\_\_  
 The number of odd positive integers between any two positive even integers  $a$  and  $b$  is  $n = \frac{b - a}{2}$ .
  
- 4) General Term of a Geometric Sequence 4) \_\_\_\_\_  
 The  $n$ th term of a geometric sequence with first term  $a_1$  and common ratio  $r$  is  $a_n = a_1 r^{n - 1}$ .
  
- 5) The Sum of the First  $n$  Term of a Geometric Sequence 5) \_\_\_\_\_  
 The sum,  $S_n$ , of the first  $n$  terms of a geometric sequence is given by  

$$S_n = \frac{a_1(1 - r^n)}{1 - r}$$
, with first term  $a_1$  and common ratio  $r$ .
  
- 6) Definition of a Binomial Coefficient 6) \_\_\_\_\_  
 For nonnegative integers  $n$  and  $r$ , with  $n \geq r$ , the expression  $\binom{n}{r}$ ,  
 (read " $n$  above  $r$ ") is called a binomial coefficient and is defined by  

$$\binom{n}{r} = \frac{n!}{r!(n - r)!}.$$
  
- 7) Expanding Binomials: The Binomial Theorem 7) \_\_\_\_\_  
 For any positive integer  $n$ ,  

$$(a + b)^n = \binom{n}{0} a^n b^0 + \binom{n}{1} a^{n-1} b^1 + \binom{n}{2} a^{n-2} b^2 + \dots + \binom{n}{n} a^0 b^n$$
  
- 8) Finding a Particular Term in a Binomial Expansion 8) \_\_\_\_\_  
 The  $r$ th term of the expansion  $(a + b)^n$  is  $\binom{n}{r-1} a^{[n-(r-1)]} b^{r-1}$