9.1
SEQUENCES & SERIES

Write the equation of the first five terms of each sequence.

$a_n = 2n+1$

$a_n = 2-(-1)^n$

$a_n = \dfrac{2+(-1)^n}{n}$

Write an expression for the most "apparent" nth term of each sequence.

a. 1, 5, 9, 13, 17,...

b. 2, -9, 28, -65, 126,...

Write the first 5 terms of the sequence.

a. $a_1 = 6; \quad a_{k+1} = a_k + 1$

b. $a_1 = -2; \; a_{n+1} = 2a_n - 2n + 3$

Factorial

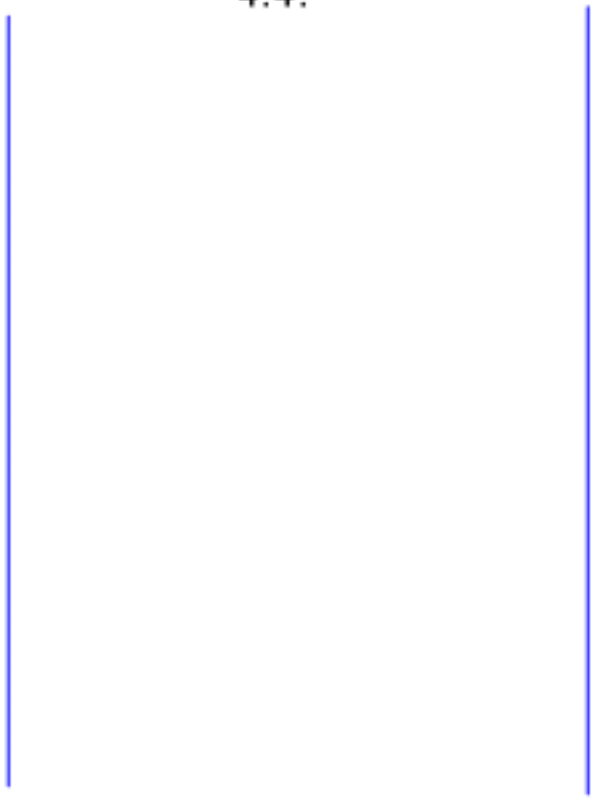
$$n! = 1 \bullet 2 \bullet 3 \bullet 4 \ldots (n-1) \bullet n$$

Evaluate each factorial expression.

a. $\dfrac{9!}{3!7!}$

b. $\dfrac{3!8!}{4!4!}$

c. $\dfrac{(n+1)!}{n!}$



Write the first five terms of the sequence given by $a_n = \frac{3^n + 1}{n!}$

Begin with n=0, then graph on your calculator.

Find the limit of each sequence. (Assume n begins with 1.)

a. $a_n = \dfrac{4n+5}{n-1}$

b. $a_n = \dfrac{4n+5}{n^2-1}$

c. $a_n = \dfrac{4n^2+5}{12n^2}$

d. $a_n = \dfrac{5}{n^3}\left[\dfrac{n(n+1)(2n+1)}{6}\right]$

Sigma (Summation Notation)

$$\sum_{i=1}^{n} a_i = a_1 + a_2 + a_3 + \ldots + a_n$$

a. $\sum_{i=1}^{4} 4i + 1$

b. $\sum_{k=2}^{5} (2 + k^3)$

c. $\sum_{i=1}^{6} \frac{2}{i!}$

For the series $\sum_{n=1}^{\infty} \frac{5}{10^n}$ find :

a. the 3rd partial sum

b. the actual sum

Write each series in sigma notation.

a. $3 + 6 + 9 + 12 + 15 + 18$

b. $10 + 17 + 26 + 37 + \ldots 101$