Sequences

1. Write the first five terms of the sequence whose n^{th} term is shown.

   a) $a_n = 5n - 2$

   b) $a_n = \dfrac{n+2}{n^2}$

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

2. Find the indicated term of the sequence whose n^{th} term is shown.

a) $a_n = \dfrac{n}{2} - 5, \quad a_{12} =$

b) $a_n = (-1)^n (2n - 1), \quad a_{25} =$

3. Write the first five terms of the sequence defined recursively.

a) $a_1 = 10$, $a_{k+1} = a_k + 2$

b) $a_1 = 3$, $a_{k+1} = 2a_k - 1$

4. Write an expression for the nth term of the sequence.

  a) $2, 4, 8, 16, ...$

  b) $\dfrac{2}{3}, \dfrac{3}{4}, \dfrac{4}{5}, \dfrac{5}{6}, ...$

  c) $7, -1, -9, -17, ...$

d) $1, \dfrac{1}{3}, \dfrac{1}{9}, \dfrac{1}{27}, \ldots$

e) $-1, \dfrac{1}{2}, -\dfrac{1}{6}, \dfrac{1}{24}, -\dfrac{1}{120}, \ldots$

Sigma notation

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

5. Evaluate each series.

a) $\displaystyle\sum_{i=1}^{4} 4i + 2$

b) $\displaystyle\sum_{i=1}^{5} \frac{i^2 + 3}{i}$

6. Use sigma notation to write the sum.

   a) $3 - 9 + 27 - 81 + 243 - 729$

   b) $\left[1 - \left(\dfrac{1}{8}\right)^2\right] + \left[1 - \left(\dfrac{2}{8}\right)^2\right] + \cdots + \left[1 - \left(\dfrac{8}{8}\right)^2\right]$

c) $\dfrac{1}{1 \cdot 3} + \dfrac{1}{2 \cdot 4} + \dfrac{1}{3 \cdot 5} + \dfrac{1}{4 \cdot 6} + \cdots + \dfrac{1}{8 \cdot 10}$