

**Math 3050 (Barsamian) Class Drill 5.1 Part 1: Sequences**

[1] (a) Let  $a_k = \frac{7-k}{7+k}$  for  $k \geq 1$ . Write the first five terms of the sequence.

(b) Let  $b_k = 2k^3$  for  $k \geq 1$ . Write the first five terms of the sequence.

(c) Let  $c_k = (-1)^k$  for  $k \geq 1$ . Write the first five terms of the sequence.

(d) Let  $d_k = \frac{(-1)^k}{3^k}$  for  $k \geq 0$ . Write the first five terms of the sequence.

[2] (a) Find an explicit formula for the sequence that begins  $-1, 1, -1, 1, \dots$

(b) Find an explicit formula for the sequence that begins  $1, \frac{-1}{2}, \frac{1}{4}, \frac{-1}{8}, \dots$

(c) Find an explicit formula for the sequence that begins  $\frac{1}{4}, \frac{2}{9}, \frac{3}{16}, \frac{4}{25}, \frac{5}{36}, \dots$

(d) Find an explicit formula for the sequence that begins  $-1, 3, -9, 27, -81, \dots$

**Math 3050 (Barsamian) Class Drill 5.1 Part 2: Summation and Product Notation**

[1] Rewrite the following using summation notation. (Do not compute the numbers!!)

(a)  $3 + 6 + 9 + \dots + 150$

(b)  $3 + 6 + 9 + \dots + 3n$

(c)  $1^4 + 2^4 + 3^4 + \dots + 972^4$

(d)  $1^4 + 2^4 + 3^4 + \dots + n^4$

(e)  $5 + 15 + 45 + 135 + \dots + 5 \cdot 3^{17}$

(f)  $5 + 15 + 45 + 135 + \dots + 5 \cdot 3^n$

[2] Compute the following sums and products. Show the calculation clearly.

(a)  $\sum_{k=0}^4 k^3$

(b)  $\sum_{k=0}^4 3^k$

(c)  $\sum_{k=0}^{95} (-1)^k$

(d)  $\prod_{k=0}^{95} (-1)^k$

(e)  $\sum_{k=2}^{100} \left( \frac{1}{k} - \frac{1}{k-1} \right)$