Name: _____

Answer the questions in the spaces provided on the following pages. If you run out of room for an answer, continue on the back of the page. Show **all** your work!

1. Write a recursive and generic formula for the following sequences
   (a) $a_n = \{1, 2, 3, 4, \ldots, n\}$

   (b) $a_n = \{3, 6, 9, 12, \ldots, n\}$

   (c) $a_n = \{1, 3, 9, 27, \ldots, n\}$

   (d) $a_n = \{\frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \ldots, n\}$

2. Rewrite the series $\sum_{n=0}^{12} \frac{n+2}{3}$ to start at $n = 3$

3. Rewrite the series $\sum_{n=5}^{20} \frac{n}{(n-1)^2}$ to start at $n = 0$

4. Strip out the last term of the sum $\sum_{n=0}^{22} \frac{n+8}{3}$

5. Rewrite the following expression as a single summation, $\sum_{i=0}^{k} i^3 + (k+1)^3$

6. Write the following in summation notation $\frac{1}{2} + \frac{2}{3^2} + \frac{3}{4^3} + \cdots + \frac{n}{(n+1)^n}$

7. Write the following expression as a single summation: $3 * \sum_{t=1}^{p} (2t-3) + \sum_{t=1}^{p} (4-5t)$