Sequences and Series 1

1. Evaluate:
   a. $4 + 10 + 16 + \ldots + 334$
   b. $5\dfrac{1}{4} + 4\dfrac{1}{2} + 3\dfrac{3}{4} + \ldots + (\text{-}3)$
   c. $100 + 110 + 121 + \ldots + 100(1 \cdot 1)^{10}$

2. In an arithmetic series, $u_9 = 15$ and $u_{10} = 12$. Calculate S_{10}.

3. In an arithmetic series, $u_3 = 17$ and $u_7 = 33$. Calculate S_{20}.

4. In an arithmetic series, $a = 2$ and $d = 3$.

   a. Find the value of n for which $S_n = 610$

   b. Find the least value for which $S_n > 1000$

5. For each of the following geometric series, prove that S_∞ exists, and find its value.

   a. $84 - 42 + 21 - \ldots$
   b. $1 - \dfrac{1}{9} + \dfrac{1}{81} - \ldots$
   c. $64 + 16 + 4 + \ldots$

6. In an infinite geometric series, $u_1 = 60$ and $u_3 = 15$.
   Show that there are 2 possible sums to infinity, and calculate them.