1. For each of the following series determine if it is geometric or not. If it is geometric find the sum or state the series diverges.

(a) \[ \sum_{n=0}^{\infty} \frac{1}{2^n} \]
- The series is geometric / is NOT geometric.
- If geometric, find the sum or state the series diverges.

(b) \[ \sum_{n=1}^{\infty} \frac{1}{n^2} \]
- The series is geometric / is NOT geometric.
- If geometric, find the sum or state the series diverges.

(c) \[ \sum_{n=0}^{\infty} \frac{2^{2n}}{3^n} \]
- The series is geometric / is NOT geometric.
- If geometric, find the sum or state the series diverges.

(d) \[ 3 - \frac{6}{5} + \frac{12}{25} - \frac{24}{125} + \frac{48}{625} - \cdots \]
- The series is geometric / is NOT geometric.
- If geometric, find the sum or state the series diverges.

2. Consider the series
\[ \sum_{n=2}^{\infty} \left( \frac{1}{n-1} - \frac{1}{n} \right) . \]

(a) Write out the partial sums \( S_3, S_4 \) and \( S_N \).

(b) Find the sum of the series or show that it diverges.