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.

1. \[ \sum_{n=0}^{\infty} \frac{1}{2^n} = \frac{1}{1-\frac{1}{2}} = 2 \]

- The series is geometric / is NOT geometric.
- If geometric, find the sum or state the series diverges.

2. \[ \sum_{n=1}^{\infty} \frac{1}{n^2} \]

- The series is geometric / is NOT geometric.
- If geometric, find the sum or state the series diverges.

3. \[ \sum_{n=0}^{\infty} \frac{2^{2n}}{3^n} = \sum_{n=0}^{\infty} \left(\frac{4}{3}\right)^n \]

- The series is geometric / is NOT geometric.
- If geometric, find the sum or state the series diverges.

\[ \frac{3}{\left(1 - \frac{4}{3}\right)} = \frac{3}{\frac{1}{3}} = 9 \]

4. \[ 3 - \frac{6}{5} + \frac{12}{25} - \frac{24}{125} + \frac{48}{625} - \cdots = \frac{3}{1 - (-\frac{5}{3})} = \frac{3}{\frac{8}{3}} = \frac{9}{8} \]

- The series is geometric / is NOT geometric.
- If geometric, find the sum or state the series diverges.