

Using the Divergence Test – Determine whether the following series diverge or state that the Divergence Test is inconclusive.

1.
$$\sum_{k=0}^{\infty} \frac{k}{k+1}$$

2.
$$\sum_{k=1}^{\infty} \frac{1+3^k}{2^k}$$

3.
$$\sum_{k=1}^{\infty} \frac{1}{k}$$

4.
$$\sum_{k=1}^{\infty} \frac{1}{k^2}$$

The Harmonic Series – Pick an appropriate test for the harmonic series, and prove that it diverges