

1. Find the sum of the following series.

(a)  $\sum_{n=0}^{\infty} (-1)^n \frac{7}{6^n}$

(b)  $\sum_{n=1}^{\infty} \frac{9}{n(n+3)}$

2. Determine whether or not the following geometric series converge. If a series converges, give its sum. If it diverges, explain why.

(a)  $\sum_{n=0}^{\infty} \frac{5}{3^n}$

(b)  $\sum_{n=0}^{\infty} \left(\frac{5}{3}\right)^n$

3. Determine whether the following series converge or diverge. Give reasons for your answers.

(a)  $\sum_{n=1}^{\infty} \frac{n}{n+1}$

(b)  $\sum_{n=2}^{\infty} \frac{\ln n}{n+1}$

(c)  $\sum_{n=1}^{\infty} \frac{5n-3}{n^2-2n+5}$

(d)  $\sum_{n=1}^{\infty} \frac{5}{n+\sqrt{n^2+4}}$

(e)  $\sum_{n=1}^{\infty} \frac{n}{2n+3}$

(f)  $\sum_{n=1}^{\infty} \sin \frac{(2n-1)\pi}{2}$