

1. Sum each of the following series.

(a) $\frac{3}{4} + \frac{1}{2} + \frac{1}{3} + \frac{2}{9} + \frac{4}{27} + \dots$

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

(c) $\sum_{n=0}^{\infty} \frac{(-3)^n}{4^{n+1}}$

(d) $\sum_{n=0}^{\infty} \frac{e^{1-n}}{2^{n+1}}$

2. Use the integral test to determine whether the following series converge.

(a) $\sum_{n=1}^{\infty} \frac{1}{n^3}$

(b) $\sum_{n=1}^{\infty} \frac{1}{\sqrt{n}}$

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

3. Determine whether the following series converge or diverge.

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

(b) $\sum_{n=1}^{\infty} \frac{3n^2 + 2n - 1}{\sqrt{n^5 + 2n^3 + 8}}$

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

(d) $\sum_{n=1}^{\infty} \frac{\ln n}{n^4}$