

Math 1552, Integral Calculus

Sections 10.2-10.3: Infinite Series, Integral Test

1. Use series to write the repeating decimal $0.31313131\dots$ as a rational number.

2. Find the sum of each convergent series below, or explain why the series diverges.

$$\sum_{k=7}^{\infty} \frac{1}{(k-3)(k+1)}, \quad \sum_{k=0}^{\infty} (-1)^k, \quad \sum_{k=2}^{\infty} \frac{2^k + 1}{3^{k+1}}$$

3. Determine if each series below converges or diverges. JUSTIFY YOUR ANSWER FULLY using either the nth term divergence test or the integral test.

(a)

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

(b)

$$\sum_{k=1}^{\infty} \frac{5k^2 + 8}{7k^2 + 6k + 1}$$