

Solution

Check convergence of $\sum_{n=1}^{\infty} \frac{7}{n} - \frac{7}{n^2}$: diverges

Steps

$$\sum_{n=1}^{\infty} \frac{7}{n} - \frac{7}{n^2}$$

Apply Series Integral Test: diverges

[Hide Steps](#)

$$\sum_{n=1}^{\infty} \frac{7}{n} - \frac{7}{n^2}$$

Series Integral Test:

If there exists an $N \geq k$ so that for all $n \geq N$, $f(n) = a_n$ is positive, continuous and decreasing

Then $\sum_{n=k}^{\infty} a_n$ and $\int_k^{\infty} f(x) dx$ either both converge or diverge

Check if $f(n)$ is positive, continuous and decreasing

$\frac{7}{n} - \frac{7}{n^2}$ is positive, continuous and decreasing from $n = 2$

$$\int_2^{\infty} \frac{7}{n} - \frac{7}{n^2} dn = \text{diverges}$$

[Show Steps](#)

By the integral test criteria

= diverges

= diverges