

§9.4: THE DIVERGENCE & INTEGRAL TESTS

1.] Determine if the following series are divergent or state that the Divergence Test is inconclusive.

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

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

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

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

2.] Determine if the following series converge or diverge using the Integral Test:

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

$$b.) \sum_{k=3}^{\infty} \frac{1}{\sqrt{2k-5}}$$

$$c.) \sum_{k=0}^{\infty} \frac{1}{k^2+4}$$

3.] Determine if the following series converge or diverge using the p -Test:

$$a.) \sum_{k=1}^{\infty} \frac{1}{k^{10}}$$

$$b.) \sum_{k=1}^{\infty} \frac{1}{k^{-1/5}}$$

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

4.] Determine if the following series converge or diverge:

$$a.) \sum_{k=1}^{\infty} \frac{\sqrt{k^2 + 1}}{k}$$

$$b.) \sum_{k=1}^{\infty} \frac{k}{e^k}$$

$$c.) \sum_{k=1}^{\infty} k^{1/k}$$