

§9.6: ALTERNATING SERIES TEST & ABSOLUTE CONVERGENCE

1.] Use the Alternating Series Test to determine if the following series converge or diverge.

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

b.)
$$2 - \frac{3}{2} + \frac{4}{3} - \frac{5}{4} + \cdots$$

c.)
$$\sum_{k=2}^{\infty} \frac{(-1)^k \ln(k)}{k}$$

2.] Suppose $n = 9$ terms of the series $-1 + \frac{1}{2!} - \frac{1}{3!} + \frac{1}{4!} - \cdots$ are summed up. First, show this series converges. Secondly, what is the maximum error committed in approximating the value of the series.

3.] Determine if the following series diverge, converge conditionally, or converge absolutely.

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

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

$$c.) \sum_{k=1}^{\infty} \left(-\frac{1}{3}\right)^k$$

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

$$e.) \sum_{k=2}^{\infty} \frac{(-1)^k k}{k+1}$$