

WRITE YOUR NAME:

MAC 2312 Quiz 20
Thursday April 4th

Determine whether the series converges absolutely, converges conditionally, or diverges.

$$\sum_{n=1}^{\infty} \frac{(-1)^{n-1}}{n} = 1 - \frac{1}{2} + \frac{1}{3} - \frac{1}{4} + \frac{1}{5} - \frac{1}{6} + \dots$$

(i) Series converges "as is" because it's alternating and the positive part of the n^{th} term is $\frac{1}{n}$ which approaches 0.

(ii) If we replace every term with its absolute value we get $\sum \left| \frac{(-1)^{n-1}}{n} \right| = \sum \frac{1}{n}$ which is the harmonic series, which diverges.

Therefore the original series is **CONDITIONALLY CONVERGENT**.