

Do the following series converge conditionally or converge absolutely?

Calculate S_{1000} . How close does this approximate the value of the series?

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

2.
$$\sum_{n=1}^{\infty} (-1)^{n+1} \frac{n^5}{n^6 + 17}$$

Show that the following series converge and approximate each series accurate within 0.001.

$$1. \sum_{n=1}^{\infty} (-1)^n \frac{4n}{n! + n + 2}$$

$$2. \sum_{k=2}^{\infty} \frac{7 - \sin(k)}{k^2 + 14k}$$