Do the following series converge conditionally or converge absolutely? Calculate S_{1000}. How close does this approximate the value of the series?

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

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

3. $\sum_{k=1}^{\infty} \dfrac{\cos(k)}{k^4 + 1}$

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

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

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