

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

If the series converges, approximate its value accurate within 10^{-5} .

$$1. \sum_{j=3}^{\infty} (-1)^{j+1} \frac{1}{j \ln(j)}$$

$$2. \sum_{m=10}^{\infty} (-1)^{m+1} \frac{6^m}{m!}$$

$$3. \sum_{t=1}^{\infty} (-1)^{t+1} \frac{4}{\cos(\sqrt{t}) + 2}$$

$$4. \sum_{k=3}^{\infty} (-1)^{k+1} \frac{\ln(k)}{k^3 + 1}$$