

Determine whether each series converges or diverges. If the series converges, find a number N such that the partial sum S_N approximates the sum of the series within .001. If the series diverges, find a number N such that $S_N \geq 1000$.

1.
$$\sum_{j=2}^{\infty} \frac{1}{j(\ln(j))^5}$$

2.
$$\sum_{n=3}^{\infty} \frac{2n}{(n^2 + 5)^{2/3}}$$

3.
$$\sum_{k=0}^{\infty} \frac{k}{k^6 + 17}$$