

**PILOT LEARNING
CALCULUS II ENGINEERING
PROBLEM-SET 11
FALL 2019**

Determine whether each of the following series converges or diverges

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| (1) $\sum_{n=1}^{\infty} \frac{(-1)^{n-1} n^2}{n^3 + 4}$ | (8) $\sum_{n=1}^{\infty} \frac{n^{100} 100^n}{n!}$ |
| (2) $\sum_{n=1}^{\infty} (-1)^{n-1} \cos \frac{\pi}{n}$ | (9) $\sum_{n=1}^{\infty} \left(\frac{n^2 + 1}{2n^2 + 1} \right)^n$ |
| (3) $\sum_{n=1}^{\infty} (-1)^{n-1} e^{2/n}$ | (10) $\sum_{n=1}^{\infty} \left(\frac{-2n}{n+1} \right)^{5n}$ |
| (4) $\sum_{n=1}^{\infty} (-1)^n n e^{-n}$ | (11) $\sum_{n=1}^{\infty} \frac{1}{n + 3^n}$ |
| (5) $\sum_{n=1}^{\infty} \frac{(-3)^n}{(2n+1)!}$ | (12) $\sum_{n=1}^{\infty} \frac{3^n n^2}{n!}$ |
| (6) $\sum_{n=1}^{\infty} \frac{n^{10}}{(-10)^{n+1}}$ | (13) $\sum_{n=1}^{\infty} n^2 e^{-n}$ |
| (7) $\sum_{n=1}^{\infty} \frac{(2n)!}{(n!)^2}$ | (14) $\sum_{n=1}^{\infty} \tan\left(\frac{1}{n}\right)$ |