

Assn #22: Infinite Series Review Exercises (§11.7)

NOTE: These problems are to be done on Engineering paper, using the standard homework format.

For exercises 1 – 6 determine whether the series converges or diverges. State any tests that you use and show all steps.

1.
$$\sum_{n=1}^{\infty} \left(\frac{\sqrt{2}}{e} \right)^n$$

2.
$$\sum_{n=1}^{\infty} \frac{5 \sin^2 n}{n!}$$

3.
$$\sum_{n=1}^{\infty} n^2 e^{-n^3}$$

4.
$$\sum_{n=1}^{\infty} \frac{1}{n \sqrt{8/e}}$$

5.
$$\sum_{n=1}^{\infty} n! e^{-n}$$

6.
$$\sum_{n=1}^{\infty} \left(\frac{1+3n}{3+4n} \right)^n$$

For exercises 7 – 12 classify the series as: Absolutely Convergent, Conditionally Convergent, or Divergent. State any tests that you use and show all steps.

7.
$$\sum_{n=1}^{\infty} (-1)^{n-1} \frac{n!}{n^n}$$

8.
$$\sum_{n=2}^{\infty} \frac{(-1)^n}{n \ln n}$$

9.
$$\sum_{n=1}^{\infty} \frac{(-1)^{n+1}}{3n+2}$$

10.
$$\sum_{n=1}^{\infty} (-1)^{n+1} n^2 \left(\frac{2}{3} \right)^n$$

11.
$$\sum_{n=1}^{\infty} \frac{(-1)^n}{n^2 + 2n + 1}$$

12.
$$\sum_{n=2}^{\infty} \frac{(-1)^n \sqrt{n}}{\ln n}$$