

For the first five problems, no work is required. Just state whether the series converges or diverges.

1. (1 point) : Convergent or Divergent?

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

2. (1 point) : Convergent or Divergent?

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

3. (1 point) : Convergent or Divergent?

$$\sum_{n=1}^{\infty} \frac{(-1)^n \sqrt{n+1}}{\sqrt{n}}$$

4. (1 point) : Convergent or Divergent?

$$\sum_{n=1}^{\infty} \frac{1}{n^n}$$

5. (1 point) : Convergent or Divergent?

$$\sum_{n=1}^{\infty} \frac{|\sin(n)|}{n^2}$$

6. (5 points) : Is the following series divergent, conditionally convergent, or absolutely convergent? Prove your answer in detail, using complete sentences and perfect notation.

$$\sum_{n=1}^{\infty} \frac{3 \cdot (-1)^n}{\sqrt{n+1}}$$

7) (5 pts) Find the Interval of Convergence of

$$\sum_{n=0}^{\infty} \frac{3^n x^n}{\sqrt{n^4 + 9}}$$