

3. [12 points]

a. [6 points] State whether each of the following series converges or diverges. Indicate which test you use to decide. Show all of your work to receive full credit.

1.
$$\sum_{n=2}^{\infty} \frac{1}{n\sqrt{\ln n}}$$

2.
$$\sum_{n=1}^{\infty} \frac{\cos^2(n)}{\sqrt{n^3}}$$

b. [6 points] Decide whether each of the following series converges absolutely, converges conditionally or diverges. Circle your answer. No justification required.

1.
$$\sum_{n=0}^{\infty} \frac{(-1)^n \sqrt{n^2 + 1}}{n^2 + n + 8}$$

Converges absolutely Converges conditionally Diverges

2.
$$\sum_{n=0}^{\infty} \frac{(-2)^{3n}}{5^n}$$

Converges absolutely Converges conditionally Diverges