

- Please see the course webpage for the answer key.

**1.** In each case determine whether the given series is **absolutely convergent**, **conditionally convergent**, or **diverges**. Name any convergence test(s) you use, and justify all of your work.

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

b. 
$$\sum_{n=1}^{\infty} (-1)^n \frac{n^3 (3n)! \ln n}{(n!)^4 2^{4n} n^n}$$

c. 
$$\sum_{n=1}^{\infty} (-1)^n \frac{3n^5 + 6}{n^9 + 5\sqrt{n} + 9}$$

d. 
$$\sum_{n=1}^{\infty} \frac{7 + n^2}{5n^2 - n + 14}$$