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1. Determine whether the following series converge absolutely, converge conditionally, or diverge:

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

(b)
$$\sum_{n=1}^{\infty} \frac{\cos(n\pi)}{n^3 \sqrt{n+1}}$$

(c) $\sum_{n=0}^{\infty} \frac{(-3)^n}{n!}$

2. For what values of x does the series $\sum_{n=1}^{\infty} \frac{n^2 x^n}{5^n}$ converge?