

Extra Series Practice

Do the following alternating series converge conditionally, converge absolutely, or diverge.

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

$$5. \sum_{n=1}^{\infty} \frac{(-3)^n n^2}{n!}$$

$$2. \sum_{j=1}^{\infty} (-1)^j \frac{\sqrt{j}}{j+5}$$

$$6. \sum_{n=1}^{\infty} (-1)^n \frac{\ln n}{\sqrt{n}}$$

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

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

Do the following series converge or diverge?

$$7. \sum_{n=1}^{\infty} (\sqrt{2}-1)$$

$$10. \sum_{k=1}^{\infty} \frac{\sqrt{k^5-6k}}{k^3+4}$$

$$8. \sum_{k=1}^{\infty} \frac{\sin(2k)}{1+2^k}$$

$$11. \sum_{k=1}^{\infty} \frac{k!}{e^k+6k}$$

$$9. \sum_{n=1}^{\infty} \frac{3^n n^2}{n!}$$

$$12. \sum_{n=1}^{\infty} \cos(n\pi) \frac{n\sqrt{n^4+5}}{(n^3+1)(n+2)}$$