

SERIOUS SERIES' PROBLEMS

Determine whether each series converges absolutely, converges conditionally, or is divergent.
Justify your answer.

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

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

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

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

$$(5) \sum_{n=0}^{\infty} \frac{n+1}{n!}$$

$$(6) \sum_{n=0}^{\infty} \frac{(-3)^n}{n!}$$

$$(7) \sum_{n=2}^{\infty} \frac{1}{n(\ln n)^2}$$

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

$$(9) \sum_{n=1}^{\infty} \frac{2^n 3^n}{n^n}$$

$$(10) \sum_{n=1}^{\infty} \frac{1}{\sqrt{n(n+1)(n+2)}}$$

$$(11) \sum_{n=1}^{\infty} \frac{1}{(3n-2)^{n+(1/2)}}$$

$$(12) \sum_{n=1}^{\infty} \frac{\tan^{-1} n}{n^2+1}$$

$$(13) \sum_{n=1}^{\infty} \frac{\ln(n!)}{n^3}$$

$$(14) \sum_{n=1}^{\infty} \frac{(-1)^n 3^n n!}{(2n)!}$$

$$(15) \sum_{n=1}^{\infty} (-1)^n \left(\frac{n}{n+1} \right)^n$$