

Name _____

Series Practice

When applying a convergence/divergence test, always state which test you are using and demonstrate that the hypotheses of the test are satisfied.

1. Determine if the following series converge or diverge.

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

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

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

$$(d) \sum_{n=0}^{\infty} \frac{(-43)^{n+1}}{n!}$$

$$(e) \sum_{n=1}^{\infty} \frac{2^n + 4}{3^n + 1}$$

$$(f) \sum_{n=1}^{\infty} \frac{5n!}{n^{12}}$$

$$(g) \sum_{n=1}^{\infty} \frac{n!2^n}{(2n)!}$$

$$(h) \sum_{n=1}^{\infty} \frac{\ln(14n)}{\ln((2n+1)^2)}$$

2. Determine if the following series converge absolutely, converge conditionally, or diverge.

(a) $\sum_{n=1}^{\infty} \frac{\cos(n)}{n^2 + 1}$

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

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