$$p > 2$$

The series

$$\sum_{n=1}^{\infty} \frac{n^2 + 1}{n^4 + 1}$$

(A) converges by the Ratio Test.

(B) diverges by the Integral Test.

(C) converges by the Limit Comparison Test with the series $\sum_{n=1}^{\infty} \frac{1}{n^2}$

(D) diverges by the Limit Comparison Test with the series $\sum_{n=1}^{\infty} \frac{1}{n}$

C

Consider the series:

$$\sum_{n=1}^{\infty} \frac{e^n}{n!}$$

If the ratio test is applied to the series, which of the following inequalities results, implying that the series converges?

(A) $\lim_{n\to\infty} \frac{e}{n!} < 1$

(B) $\lim_{n\to\infty} \frac{n!}{e} < 1$

(C) $\lim_{n\to\infty} \frac{n+1}{e} < 1$

(D) $\lim_{n\to\infty} \frac{e}{n+1} < 1$

(E) $\lim_{n\to\infty} \frac{e}{(n+1)!} < 1$

D

Which statement is true about the series:

$$\sum_{n=1}^{\infty} e^{2/n}$$

(A) The nth term test concluded that the series converges.

(B) The nth term test concluded that the series diverges.

(C) The nth term test hypotheses are not met by this series, so the nth term test cannot be applied.

(D) The nth term test hypotheses are met by this series; however, the nth term test is inconclusive.

(E) None of the above are true.

B

Determine whether the following series converges or diverges:

$$\sum_{n=1}^{\infty} \frac{\sqrt{n}+1}{e^n}$$

The series converges by the ratio test.

Determine whether the following series converges or diverges:

$$\sum_{n=1}^{\infty} \frac{\sqrt{n^2 + n^3}}{3n^2 + 7n}$$

The series diverges by the limit comparison test.

Determine whether the following series converges or diverges by using the integral test.

$$\sum_{n=1}^{\infty} \frac{2n}{n^2+1}$$

The series diverges by the integral test.

What are all values of p for which the series

$$\sum_{n=1}^{\infty} \frac{n}{n^p + 1}$$

converges?