MATH 141, FALL 2011

Investigate the convergence of the following positive series:

$$\sum_{n=1}^{\infty} \frac{1}{\sqrt{n(n+1)}} \qquad \textit{divergent}$$

$$\sum_{n=1}^{\infty} \frac{1000^n}{n!} \qquad \textit{convergent}$$

$$\sum_{n=1}^{\infty} \frac{(n!)^2}{(2n)!} \qquad \textit{convergent}$$

$$\sum_{n=1}^{\infty} \frac{n1}{n^n} \qquad \textit{convergent}$$

$$\sum_{n=1}^{\infty} \frac{2^n n!}{n^n} \qquad \textit{convergent}$$

$$\sum_{n=2}^{\infty} \frac{1}{\sqrt[n]{\ln(n)}} \qquad \textit{divergent}$$

$$\sum_{n=1}^{\infty} \frac{n^5}{2^n + 3^n} \qquad \textit{convergent}$$

$$\sum_{n=1}^{\infty} \frac{3 + (-1)^n}{2^{n+1}} \qquad \textit{convergent}$$

$$\sum_{n=2}^{\infty} \frac{1}{n \ln^p(n)} \qquad \textit{convergent for } p>1$$

$$\sum_{n=2}^{\infty} \frac{1}{n \ln^p(n) \ln^q(\ln(n))} \qquad \textit{convergent for } p>1 \textit{ and any } q, \textit{ or for } p=1 \textit{ and } q>1$$