1. Sečtěte

$$\sum_{n=1}^{\infty}\frac{1}{n(n+3)}, \qquad \sum_{n=1}^{\infty}\frac{2n+1}{n^2(n+1)^2}.$$

Rozhodněte o konvergenci řad (ev. v závislosti na parametrech):

2.

$$\sum_{n=1}^{\infty}\frac{1}{n}(\sqrt{n+1}-\sqrt{n-1}) \qquad \sum_{n=1}^{\infty}\sin\left(\frac{n}{n^2+1}\right)$$

3.

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

4.

$$\sum_{n=1}^{\infty}\frac{\ln\{n!\}}{n^{\alpha}} \qquad \sum_{n=1}^{\infty}\frac{n^{n\alpha}}{n!}$$

5.

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

6.

$$\sum_{n=1}^{\infty}\frac{2\cdot 5\cdot 8\cdots(3n-1)}{1\cdot 5\cdot 9\ldots(4n-3)} \qquad \sum_{n=1}^{\infty}\frac{[n!]^2}{2^{n^2}}$$

7.

$$\sum_{n=1}^{\infty}\frac{n^2}{(\frac{\pi}{3}+\frac{1}{n})^n} \qquad \sum_{n=1}^{\infty}\frac{[n!]^2}{[2n]!}$$

8.

$$\sum_{n=1}^{\infty}\frac{n^n}{(2n^2+n+1)^{\frac{n}{2}}} \qquad \sum_{n=2}^{\infty}\frac{1}{n^p\{\ln n\}^q}$$

9.

$$\sum_{n=1}^{\infty}\frac{1}{n(\ln n)^p(\ln\ln n)^q} \qquad \sum_{n=1}^{\infty}\mathrm{e}^{-\sqrt[3]{n}}$$

10.

$$\sum_{n=1}^{\infty}\frac{p(p+1)\cdots(p+n-1)}{n!}\frac{1}{n^q} \qquad \sum_{n=1}^{\infty}\Big(\frac{1\cdot 3\cdots(2n-1)}{2\cdot 4\cdots 2n}\Big)^p$$