

Kalkulus 16. gyakorlat megoldások

2025. november 23.

1.feladat

Mind divergens, mert $a_k \nrightarrow 0$.

2.feladat

a, divergens

b, konvergens

c, divergens

d, divergens

e, konvergens

3.feladat

a, $\sum_{k=0}^{+\infty} \left(\frac{2}{3}\right)^k = 3$

b, $\sum_{k=2}^{+\infty} \left(\frac{2}{3}\right)^k = \frac{4}{3}$

c, $\sum_{k=1}^{+\infty} \left(-\frac{1}{\pi}\right)^k = \frac{1}{\pi+1}$

d, $\sum_{k=0}^{+\infty} \pi^{k+1} = +\infty$

e, $\sum_{k=1}^{+\infty} \frac{4^k - 1}{5^k} = \frac{15}{4}$

f, $\sum_{k=1}^{+\infty} \frac{2 \cdot 6^k}{3^{k+2}} = +\infty$

g, $\sum_{k=2}^{+\infty} \frac{5 - 2^{3k+2}}{3^{2k-1}} = \frac{-681}{8}$

h, $\sum_{k=3}^{+\infty} \frac{(-1)^k 10^k}{3 \cdot 4^{k-1}}$ divergens

i, $\frac{3}{4} - \frac{9}{16} + \frac{27}{64} - \dots = \sum_{k=1}^{+\infty} (-1)^{k+1} \left(\frac{3}{4}\right)^k = \frac{3}{7}$

j, $-\frac{3}{20} + \frac{3}{40} - \frac{3}{80} + \dots = -\frac{3}{5} \sum_{k=2}^{+\infty} \left(-\frac{1}{2}\right)^k = -\frac{1}{10}$

4.feladat

$$\sum_{k=1}^{+\infty} \frac{1}{k(k+1)} = 1$$