

1.3 Cvičenia 1

1. Nájdite súčet nekonečného radu:

a) $\sum_{n=1}^{\infty} \frac{1}{(n+1)(n+2)};$	[1/2]	e) $\sum_{n=1}^{\infty} \frac{1}{(2n-1)(2n+1)};$	[0, 5]
b) $\sum_{n=1}^{\infty} \frac{2}{n(n+1)(n+2)};$	[1/2]	f) $\sum_{n=1}^{\infty} \frac{n}{(2n-1)^2(2n+1)^2};$	[1/8]
c) $\sum_{n=1}^{\infty} \frac{1}{(5n-4)(5n+1)};$	[1/5]	g) $\sum_{n=1}^{\infty} (-1)^{n+1} \left(\frac{2}{3}\right)^n;$	[2/5]
d) $\sum_{n=1}^{\infty} \frac{2n+1}{n^2(n+1)^2};$	[1]	h) $\sum_{n=1}^{\infty} (-1)^n \left(\frac{5}{7}\right)^n.$	[-5/12]

2. Pomocou d'Alembertovho kritéria zistite konvergenciu radov:

a) $\sum_{n=1}^{\infty} \frac{n}{2^n};$	[Konverguje]	d) $\sum_{n=1}^{\infty} \frac{(-1)^n n}{(n+1)!};$	[Konverguje]
b) $\sum_{n=1}^{\infty} \frac{(n!)^2}{(2n)!};$	[Konverguje]	e) $\sum_{n=1}^{\infty} \frac{n!}{n^n}.$	[Konverguje]
c) $\sum_{n=1}^{\infty} \frac{n!}{10^n};$	[Diverguje]	f) $\sum_{n=1}^{\infty} \frac{n^5}{2^n}.$	[Konverguje]

3. Pomocou Cauchyho kritéria zistite konvergenciu radov:

a) $\sum_{n=1}^{\infty} \left(\frac{2n}{5n+4}\right)^{2n-158};$	[Konverguje]	c) $\sum_{n=1}^{\infty} \frac{1}{(\ln(n+1))^{n+1}}.$	[Konverguje]
b) $\sum_{n=1}^{\infty} \left(\frac{n+2}{2n-1}\right)^{3n+7};$	[Konverguje]	d) $\sum_{n=1}^{\infty} \frac{1}{3^n} \left(\frac{n}{n+1}\right).$	[Konverguje]

4. Pomocou Cauchyho integrálneho kritéria zistite konvergenciu radov:

a) $\sum_{n=1}^{\infty} \frac{2}{3+n^2};$	[Konverguje]	c) $\sum_{n=10}^{\infty} \frac{3}{n \ln n};$	[Diverguje]
b) $\sum_{n=1}^{\infty} \frac{e^{-\sqrt{n}}}{\sqrt{n}};$	[Konverguje]	d) $\sum_{n=10}^{\infty} \frac{1}{n \ln^2 n};$	[Konverguje]

5. Preskúmajte konvergenciu radov s kladnými členmi:

a) $\sum_{n=1}^{\infty} \frac{n^3}{e^n};$	[Konverguje]	b) $\sum_{n=1}^{\infty} \frac{2^n n!}{n^n};$	[Konverguje]
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$$\text{c) } \sum_{n=1}^{\infty} \frac{5^n n!}{n^n}; \quad [\text{Diverguje}]$$

$$\text{d) } \sum_{n=1}^{\infty} \frac{10^n 2n!}{(2n)!}; \quad [\text{Konverguje}]$$

6. Pomocou Leibnizovho kritéria rozhodnite o konvergencii radov:

$$\text{a) } \sum_{n=1}^{\infty} \frac{(-1)^{n-1}}{2n-1}; \quad [\text{Rel. konv.}] \quad \text{c) } \sum_{n=1}^{\infty} \frac{(-1)^n}{\sqrt{n}}; \quad [\text{Rel.konv.}]$$

$$\text{b) } \sum_{n=1}^{\infty} \frac{(-1)^{n+1}(n+3)}{n+2}; \quad [\text{Div.}] \quad \text{d) } \sum_{n=2}^{\infty} \frac{(-1)^n}{n \ln n}; \quad [\text{Rel.konv.}]$$