

17. minitest MAT2

24. 4. 2025

Určete součet řad

$$a) \sum_{n=0}^{\infty} \frac{2^{n+3} + 3^{n+2}}{2^{2n+1} + 2^{2n+2}} \quad b) \sum_{n=0}^{\infty} \frac{2^{n+3} \cdot 3^{n+2}}{2^{2n+1} + 2^{2n+2}}$$

$$\begin{aligned}
 a) \sum_{n=0}^{\infty} \frac{8 \cdot 2^n + 9 \cdot 3^n}{4^n (2+4)} &= \sum_{n=0}^{\infty} \frac{8}{6} \cdot \frac{2^n}{4^n} + \sum_{n=0}^{\infty} \frac{9}{6} \cdot \frac{3^n}{4^n} = \\
 &= \frac{4}{3} \cdot \underbrace{\sum_{n=0}^{\infty} \left(\frac{1}{2}\right)^n}_{= \frac{1}{1-\frac{1}{2}} = 2} + \frac{3}{2} \cdot \underbrace{\sum_{n=0}^{\infty} \left(\frac{3}{4}\right)^n}_{= \frac{1}{1-\frac{3}{4}} = 4} = \frac{4}{3} \cdot 2 + \frac{3}{2} \cdot 4 = \\
 &= \frac{8}{3} + 6 = \underline{\underline{\frac{26}{3}}}
 \end{aligned}$$

$$b) \sum_{n=0}^{\infty} \frac{2^n \cdot 8 \cdot 3^n \cdot 9}{4^n \cdot (2+4)} = \frac{42}{6} \cdot \sum_{n=0}^{\infty} \left(\frac{2 \cdot 3}{4}\right)^n = \underline{\underline{+ \infty}}$$

↓
geometrická řada

Δ koeficientem $\frac{3}{2} > 1$