

Matematika G1F - 3. gyakorlat

2021. szeptember 29.

Sorozatok határértéke II.

Számítsuk ki a következő sorozatok határértékét!

$$\textcircled{1.} \quad \text{a) } a_n = \frac{n^2 + 3}{2n - 1} \quad \text{b) } a_n = \frac{3n - 2n^3}{n^2 + n} \quad \text{c) } a_n = \frac{5n^4 - n^3 + 5n}{n^5 + n - 1} \quad \text{d) } a_n = \frac{3n^3 - n + 5}{2n^3 + 2n^2 - 1}$$

$$\text{e) } a_n = \frac{\sqrt{n^2 + n + 1} + 1}{2n - \sqrt{n + 1}} \quad \text{f) } a_n = \frac{2^{3n-1} - 27^{\frac{n}{3}}}{2 \cdot 8^{n-1} + 2^{n+1} \cdot 3^{n-1}}$$

$$\textcircled{2.} \quad \text{a) } a_n = \sqrt{n^2 + 1} - n \quad \text{b) } a_n = \frac{\sqrt{2n^2 + 1} - \sqrt{n^2 - 1}}{2n + 3} \quad \text{c) } a_n = \frac{\sqrt{2n + 1} - \sqrt{n - 1}}{\sqrt{2n - 1} - \sqrt{n}}$$

$$\textcircled{3.} \quad \text{a) } a_n = \left(1 + \frac{1}{3n}\right)^n \quad \text{b) } a_n = \left(1 - \frac{1}{2n}\right)^{3n} \quad \text{c) } a_n = \left(1 + \frac{2}{n}\right)^{5n} \quad \text{d) } a_n = \left(\frac{n-1}{n+1}\right)^n$$

$$\text{e) } a_n = \left(1 + \frac{1}{3n-2}\right)^{6n+1} \quad \text{f) } a_n = \left(1 + \frac{1}{2n+1}\right)^{3n+1}$$

$$\textcircled{4.} \quad \text{a) } a_n = \sqrt[n]{7n^3} \quad \text{b) } a_n = \sqrt[n]{n^2 + 2} \quad \text{c) } a_n = \sqrt[n]{n^5 - 1} \quad \text{d) } a_n = \sqrt[n]{n^3 + 2}$$

$$\textcircled{5.} \quad \text{a) } a_n = \frac{n}{n^2 + 1} \cdot \sin(n^2 + 1) \quad \text{b) } a_n = \frac{\sin(2n + 1) + \cos^2(3n)}{n^2 + 1}$$