

1. Gyak. Számsorozatok

1. (a) $\lim \frac{2^{3n-1} - 27^{\frac{n}{3}}}{2 \cdot 8^{n-1} + (2 \cdot 3)^{n+1}} = ?$
- (b) $\lim \frac{8^{n+1} + 4^{n-2}}{2 \cdot 2^{3n} + 2^{1+2n}} = ?$
- (c) $\lim \frac{125^{\frac{n}{3}} - 9^{\frac{n}{2}+1} + (\sqrt{3})^{2n} \cdot 8^{\frac{n}{3}}}{2 \cdot 5^{2n} + 2^{3n} - (-2)^{n+1}} = ?$
- (d) $0 < a < b < 1$
 $\lim \frac{1 + a + a^2 + \dots + a^n}{1 + b + b^2 + \dots + b^n} = ?$
2. (a) $\lim \frac{4}{n(n - \sqrt{n^2 + 1})} = ?$
- (b) $\lim \sqrt{n}(\sqrt{n-1} - \sqrt{n+1}) = ?$
- (c) $\lim \frac{\sqrt{3n+1} - \sqrt{3n}}{\sqrt{n+1} - \sqrt{n-1}} = ?$
- (d) $\lim \left(\sqrt{n + \sqrt{n}} - \sqrt{n - \sqrt{n}} \right) = ?$
- (e) * $\lim (\sqrt[3]{n+2} - \sqrt[3]{n}) = ?$
- (f) * $\lim \frac{\sqrt[3]{n+1} - \sqrt[3]{n}}{\sqrt{n+1} - \sqrt{n}} = ?$
3. (a) $\lim \left(1 - \frac{2}{n+1} \right)^n = ?$
- (b) $\lim \left(\frac{n+1}{n+3} \right)^{2n} = ?$
- (c) $\lim \left(\frac{2+2n}{2n+3} \right)^{n-1} = ?$
- (d) $\lim \left(\frac{n^2+2}{n^2-4} \right)^{n^2} = ?$
4. (a) $\lim \left(\frac{\sqrt[3]{n^3+2n+1}}{n+1} - \sqrt[n]{2n^3+5n^2} \right) = ?$
- (b) $\lim \frac{3n^2\sqrt{n} - n + 2}{\sqrt{n^5+n^2}} = ?$
- (c) $\lim \frac{\sqrt[n]{2} + 3\sqrt[n]{n}}{\sqrt[n]{n^2+n}} = ?$
- (d) $\lim \frac{\sum_{k=1}^{n+1} k}{\binom{n+1}{2}} = ?$
- (e) $\lim \frac{\sin^2 n}{n!} = ?$
- (f) $\lim 2^{\frac{1}{n}} = ?$
- (g) $\lim \frac{n!}{(n+2)!} = ?$
- (h) $\lim \frac{\binom{n}{2}}{(n+1)^2} = ?$
- (i) $\lim \sqrt{\frac{8n^3 - n^2 + 1}{n^3 + 1}} = ?$