1

TEDEN 5

$$z^4 = -7 + 24i$$

$$|z| = \sqrt{x^2 + y^2} \rightarrow |z| = \sqrt{25}$$

$$\tan\varphi = \frac{y}{x} \rightarrow \varphi = -\arctan\left(\frac{24}{7}\right) + \pi \quad (x<0, y>0 \rightarrow \text{II kvadrant})$$

$$z_K = \sqrt[n]{|z|} \cdot \left(\cos\left(\frac{\varphi}{n} + \frac{2\pi}{n}\cdot K\right) + i \cdot \sin\left(\frac{\varphi}{n} + \frac{2\pi}{n}\cdot K\right)\right), \quad K = \underbrace{0,1,2,3}_{\text{št. k-jev} = n}$$

$$z_K = \sqrt[4]{25}\left(\cos\left(\frac{\varphi}{4} + \frac{2\pi}{4}\cdot K\right) + i\cdot\sin\left(\frac{\varphi}{4} + \frac{2\pi}{4}\cdot K\right)\right)$$

$$z_0 = \sqrt[4]{25}\left(\cos\left(\frac{-\arctan\left(\frac{24}{7}\right)+\pi}{4} + \frac{2\pi}{4}\cdot 0\right) + i\cdot\sin\left(\frac{-\arctan\left(\frac{24}{7}\right)+\pi}{4} + \frac{2\pi}{4}\cdot 0\right)\right) = 2 + i \checkmark$$

$$z_1 = \sqrt[4]{25}\left(\cos\left(\frac{-\arctan\left(\frac{24}{7}\right)+\pi}{4} + \frac{2\pi}{4}\cdot 1\right) + i\cdot\sin\left(\frac{-\arctan\left(\frac{24}{7}\right)+\pi}{4} + \frac{2\pi}{4}\cdot 1\right)\right)$$

$$z_2 = \sqrt[4]{25}\left(\cos\left(\frac{-\arctan\left(\frac{24}{7}\right)+\pi}{4} + \frac{2\pi}{4}\cdot 2\right) + i\cdot\sin\left(\frac{-\arctan\left(\frac{24}{7}\right)+\pi}{4} + \frac{2\pi}{4}\cdot 2\right)\right)$$

$$z_3 = \sqrt[4]{25}\left(\cos\left(\frac{-\arctan\left(\frac{24}{7}\right)+\pi}{4} + \frac{2\pi}{4}\cdot 3\right) + i\cdot\sin\left(\frac{-\arctan\left(\frac{24}{7}\right)+\pi}{4} + \frac{2\pi}{4}\cdot 3\right)\right)$$

$$z^3 = 52 + 47i$$

$$|z| = \sqrt{52^2 + 47^2} = \sqrt{4913} = 17\sqrt{17}$$

$$\tan\varphi = \frac{y}{x} = \frac{47}{52}$$

$$\sqrt[6]{4913} \cdot e^{i\frac{\varphi}{3} + \frac{2k\pi}{3}} =$$

$$\sqrt[6]{4913}\left(\cos\left(\frac{\varphi}{3}\right) + i\sin\left(\frac{\varphi}{3}\right)\right)$$

$$= 4 + i1 \checkmark$$

$$z^4 = 28 - 96i$$

$$z = \sqrt[8]{28^2 + 96^2}\left(\cos\left(\frac{\tan^{-1}\left(-\frac{96}{28}\right)}{4} + \frac{2\pi}{4}\cdot k\right) + i\sin\left(\frac{\tan^{-1}\left(-\frac{96}{28}\right)}{4} + \frac{2\pi}{4}\cdot k\right)\right)$$

$$z_0 = 3 - 1i$$

$$z_1 = 1 + 3i \checkmark$$

2

$$a_n = \frac{10^{3n}}{n!}$$

od katerega člena je strogo padajoče

$$a_n > a_{n+1}$$

$$\frac{10^{3n}}{n!} > \frac{10^{3(n+1)}}{(n+1)!} \quad \Big| \, n!\,(n+1)!$$

$$10^{3n} \cdot (n+1)! > 10^{3n+3} \cdot n!$$

$$\frac{(n+1)!}{n!} > \frac{10^{3n+3}}{10^{3n}}$$

razlika med
$n!$ in $(n+1)!$
je n.

$$n > 10^3$$

$$n > 1000$$

✓

$$a_n = \frac{9^{3n}}{n!}$$

$$\frac{9^{3n}}{n!} > \frac{9^{3n+3}}{(n+1)!}$$

$$9^{3n}\,(n+1)! > 9^{3n+3}\,(n!)$$

$$n > 9^3 = 729$$

✓

$$a_n = \frac{7^{3n}}{n!}$$

$$\frac{7^{3n}}{n!} > \frac{7^{3(n+1)}}{(n+1)!}$$

$$\frac{(n+1)!}{n!} > \frac{7^{3n+3}}{7^{3n}}$$

$$n > 7^3 = 343$$

✓

3

$$\lim_{x\to\infty} = \frac{n^6 - n + 7\cdot 5^{n+1}}{5^n + n^4 - 12} \begin{matrix} :5^n \\ :5^n \end{matrix} = \frac{\cancel{\frac{n^6}{5^n}}^{\to 0} - \cancel{\frac{n}{5^n}}^{\to 0} + 7\cdot 5}{1 + \cancel{\frac{n^4}{5^n}}^{\to 0} - \cancel{\frac{12}{5^n}}^{\to 0}} = 35$$

$4^{n+1} = 4^n \cdot 4^1$ $\qquad$ $4^{n-1} = \frac{4^n}{4}$

$$\lim_{x\to\infty} = \frac{n^6 + n + 7\cdot 4^{n+1}}{4^n - 16} \begin{matrix} :4^n \\ :4^n \end{matrix} = \frac{7\cdot 4}{1} = 28$$

PAZI NA MINUS

$$\lim_{x\to\infty} \frac{n^6 + n - 24\cdot 4^n}{2\cdot 4^{n+1} - n^2} \begin{matrix} :4^n \\ :4^n \end{matrix} = \frac{\cancel{\frac{n^6}{4^n}}^{\to 0} + \cancel{\frac{n}{4^n}}^{\to 0} - \frac{24\cdot \cancel{4^n}}{\cancel{4^n}}}{\frac{2\cdot \cancel{4^{n+1}}}{\cancel{4^n}} - \cancel{\frac{n^2}{4^n}}^{\to 0}} = \frac{-24}{2\cdot 4} = \frac{-24}{8} = -3$$

4

$$\frac{6n^2+2n-2}{3n^2+n+2}$$

$$a=\lim_{n\to\infty}\frac{6n^2+2n-2}{3n^2+n+2}\ \begin{matrix}(:n^2)\\(:n^2)\end{matrix} = \frac{6}{3} = 2$$

splošni člen, limita, okolica

$$|a_n - a| < \varepsilon$$

I
$$\frac{6n^2+2n-2}{3n^2+n+2} - 2 < \frac{1}{40}$$

$$6n^2+2n-2 < \frac{81}{40}(3n^2+n+2) \quad /:2$$

$$3n^2+1n-1 < \frac{81}{80}(3n^2+n+2) \quad /\cdot 80$$

$$240n^2+80n-80 < 248n^2+81n+160$$

$$0 < 8n^2+n+240$$

$$-\frac{6n^2+2n-2}{3n^2+n+2} + 2 < \frac{1}{40}$$

$$\frac{79}{40}(3n^2+n+2) < 6n^2+2n-2 \ /\cdot 40$$

$$237n^2+79n+158 < 240n^2+80n-80$$

$$0 < 3n^2+n-238$$

$$n_1 = 8{,}7 \checkmark \qquad n_2 = -9{,}1 \ //$$

$$k = 9$$

$$-\frac{15n^2+3n-1}{5n^2+2} + 3 < \frac{1}{30}$$

$$\frac{89}{30} > \frac{15n^2+3n-1}{5n^2+2} \quad /\cdot 30(5n^2+2)$$

$$89(5n^2+2) > 30(15n^2+3n-1)$$

$$445n^2+178 > 450n^2+90n-30$$

$$5n^2-90n+208 > 0$$

$$n = 15{,}27 \checkmark \qquad K = 16$$

$$n_2 = 2{,}7$$