

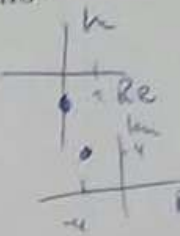
2. série

1. Dané komplexní číslo z načrtněte do komplexní roviny a запиšte v goniometrickém tvaru, určete číslo komplexně sdružené.

(a) $z = i^3 = -i = 1 \cdot (\cos \frac{3\pi}{2} + i \sin \frac{3\pi}{2}) = 4\sqrt{2} \cdot e^{i \frac{3\pi}{4}} \quad \bar{z} = i$

(b) $z = -4 + 4i = 4\sqrt{2} (\cos \frac{3\pi}{4} + i \sin \frac{3\pi}{4}) = 4\sqrt{2} \cdot e^{i \frac{3\pi}{4}} \quad \bar{z} = -4 - 4i$

$\bar{z} = \sqrt{3} + 3i \rightarrow$ (c) $z = \sqrt{3} - 3i = 2\sqrt{3} (e^{i \frac{5\pi}{6}})$



2. Řešte v komplexním oboru rovnice

(a) $-z^2 + z = 2,$

$z_{1,2} = \frac{1}{2} \pm i \frac{\sqrt{7}}{2}$

(b) $2z^2 - 2z + 1 = 0,$

$z_{1,2} = \frac{1}{2} \pm i \frac{\sqrt{3}}{2}$

(c) $2\lambda^2 + 3\lambda + 3 = 0, \quad \lambda_{1,2} = -\frac{3}{4} \pm i \frac{\sqrt{15}}{4}$

3. Určete definiční obor $D(f)$ reálné funkce

(a) $f(x) = \frac{1}{49 - x^2} + \sqrt{-x}$

$Df = (-\infty, -7) \cup (-7, 0)$

(b) $f(x) = \frac{\sqrt{4x + x^2}}{2 - \ln x}$

$Df = (0, e^2) \cup (e^2, +\infty)$

(c) $f(x) = \frac{\sqrt{x^2 - x + 3}}{\sqrt[3]{x}},$

$Df = \mathbb{R} \setminus \{0\}$

(d) $f(x) = \log\left(\frac{3+x}{2-x}\right),$

$Df = (-3, 2)$

(e) $f(x) = \ln(2^x + 4),$

$Df = \mathbb{R}$

(f) $f(x) = \frac{2}{2 - e^{-x}},$

$Df = \mathbb{R} \setminus \{-\ln 2\}$

(g) $f(x) = \frac{\sqrt{x-1}}{\sqrt{6+2x}},$

$Df = [1, +\infty)$

(h) $f(x) = \sqrt{\frac{x-1}{6+2x}},$

$Df = (-\infty, -3) \cup [1, +\infty)$

(i) $f(x) = \sqrt{3 - \log_2(x+1)}.$

$Df = (-1, 7)$