

## REŠITVE DOMAČE NALOGE - KEMIJA

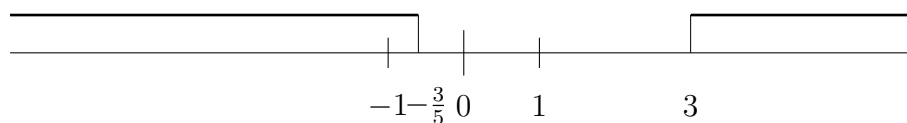
predmet: MATEMATIKA 1  
asist. Andreja Drobnič Vidic

### REALNA IN KOMPLEKSNA ŠTEVILA

Inženir mora obvladati splošne matematične metode, primerne za reševanje množice nalog; samo tedaj lahko rešuje resnično nove probleme iz svoje stroke.

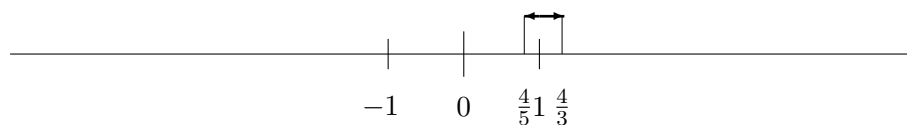
A.N. Krilov

1. a)  $(-\infty, 1) \cup (2, \infty)$
- b)  $(-\infty, 0) \cup (2, \infty)$
- c)  $\mathbb{R}$
2. a)  $(-\infty, -\frac{3}{5}] \cup [3, \infty)$



Skica 1. Grafičen prikaz rešitve naloge.

- b)  $(\frac{4}{5}, \frac{4}{3})$



Skica 2. Grafičen prikaz rešitve naloge.

3. Rešitev:  $|2x - 3| - |x + 2| = \begin{cases} -x + 5, & \text{za } x < -2 \\ -3x + 1, & \text{za } -2 \leq x < \frac{3}{2} \\ x - 5, & \text{za } x \geq \frac{3}{2} \end{cases}$   
Zaloga vrednosti te funkcije je  $[-\frac{7}{2}, \infty)$ .

4. ni realnih rešitev

5. a)  $z_1 = \frac{-1+\sqrt{3}i}{2}, z_2 = \frac{-1-\sqrt{3}i}{2}$

b)  $z = 3 - i$

c)  $z_1 = 0, z_2 = \sqrt{3} - i, z_3 = -\sqrt{3} - i$

d)  $z = x \pm 2i\sqrt{x-1}, x \geq 1$  ( $z = \frac{y^2}{4} + 1 + iy, y \text{ iz } \mathbb{R}$ )

e)  $z = 2^{-\frac{2}{3}}(1 + i)$

6. Vrednost  $z^{23}$  računamo s pomočjo Moivreove formule:

$$z^{23} = 8^{11} \cdot \sqrt{8} \left( -\frac{\sqrt{2}}{2} - i \frac{\sqrt{2}}{2} \right) = -2^{34}(1 + i)$$

7. a)

$$k = 0: \quad z_0 = \sqrt[6]{2}(\cos 105^\circ + i \sin 105^\circ) = \sqrt[6]{2}(\cos \frac{7\pi}{12} + i \sin \frac{7\pi}{12})$$

$$k = 1: \quad z_1 = \sqrt[6]{2}(\cos 225^\circ + i \sin 225^\circ) = \sqrt[6]{2}(\cos \frac{15\pi}{12} + i \sin \frac{15\pi}{12})$$

$$k = 2: \quad z_2 = \sqrt[6]{2}(\cos 345^\circ + i \sin 345^\circ) = \sqrt[6]{2}(\cos \frac{23\pi}{12} + i \sin \frac{23\pi}{12})$$

b)  $z = \sqrt[4]{10}(\cos(\frac{\varphi}{2} + \frac{2k\pi}{2}) + i \sin(\frac{\varphi}{2} + \frac{2k\pi}{2})), k = 0, 1; \varphi = \pi - \arctan(3)$

$$k = 0: \quad z_0 = \sqrt[4]{10}(\cos 54.217^\circ + i \sin 54.217^\circ) \approx 1.93(\cos 0.95 + i \sin 0.95)$$

$$k = 1: \quad z_1 = \sqrt[4]{10}(\cos 234.217^\circ + i \sin 234.217^\circ) \approx 1.93(\cos 4.09 + i \sin 4.09)$$

c) 6-koreni enote

8.  $z = 0$