

Dorja Bradica, Ivona Kolarić, Tímea Krajina, Ema Mangjlović 2.b.

1. Riješi jednačbe. (3 boda)

a) $4x^2 - 3x = 0$

b) $0.2x^2 - 125 = 0$

c) $10x^2 - 3x - 1 = 0$

2. Riješi jednačbe. (4 boda)

a) $\frac{x^2 - 4}{8} - \frac{2x + 3}{5} = 1 \quad | \cdot 40$

$$5(x^2 - 4) - 8(2x + 3) = 40$$

$$5x^2 - 4 - (16x + 24) = 40$$

$$5x^2 - 4 - 16x + 24 = 40$$

$$5x^2 - 16x - 20 = 0$$

$$x_{1,2} = \frac{16 \pm \sqrt{256 + 40}}{20}$$

$$x_{1,2} = \frac{16 \pm 4\sqrt{41}}{20}$$

$$x_1 = \frac{16 + 4\sqrt{41}}{20} = \frac{4 + \sqrt{41}}{5}$$

$$x_2 = \frac{16 - 4\sqrt{41}}{20} = \frac{4 - \sqrt{41}}{5}$$

b) $\frac{2}{5x - 10} - \frac{1.6}{x^2 - 4} = \frac{x - 1}{3x^2 + 6x}$

3. Za koju vrijednost parametra b jednačba $2x^2 - bx + 2 = 0$ ima različita realna rješenja? (3 boda)

$$2x^2 - bx + 2 = 0$$

$$\Delta > 0$$

$$-b^2 - 4ac > 0$$

$$b^2 - 16 > 0$$

$$b - 4 > 0 \quad b + 4 > 0$$

$$b > 4 \quad b > -4$$

$$b \in \langle -4, +\infty \rangle$$

$$1. a) 4x^2 - 3x = 0$$

$$x(4x-3) = 0$$

$$x_1 = 0 \quad x_2 = \frac{3}{4}$$

$$b) 0.2x^2 - 125 = 0$$

$$0.2x^2 = 125 \quad | :0.2$$

$$x^2 = 625 \quad | \sqrt{\quad}$$

$$x = \pm 25$$

$$c) 10x^2 - 3x - 9 = 0$$

$$x_{1,2} = \frac{3 \pm \sqrt{9+40}}{20}$$

$$x_{1,2} = \frac{3 \pm 7}{20}$$

$$x_1 = \frac{9}{20} \quad x_2 = \frac{-4}{20} = -\frac{1}{5}$$

2. a)

$$b) \frac{2}{5x-10} - \frac{1.6}{x^2-4} = \frac{x-1}{3x^2+6x}$$

$$\frac{2}{5(x-2)} - \frac{1.6}{(x-2)(x+2)} = \frac{x-1}{3x(x+2)} \quad | \cdot 15x(x-2)(x+2) \neq 0$$

$$x \neq -2 \\ x \neq 2$$

$$6x(x+2) - 24x = 5(x-2)(x-1)$$

$$6x^2 + 12x - 24x = 5(x^2 - x - 2x + 2)$$

$$6x^2 + 12x - 24x = 5(x^2 - 3x + 2)$$

$$6x^2 + 12x - 24x = 5x^2 - 15x + 10$$

$$6x^2 + 12x - 24x - 5x^2 + 15x - 10 = 0$$

$$x^2 + 3x - 10 = 0$$

$$x_{1,2} = \frac{-3 \pm \sqrt{9+40}}{2}$$

$$x_{1,2} = \frac{-3 \pm 7}{2}$$

$$x_1 = \frac{-10}{2} \quad x_2 = \frac{4}{2}$$

$$x_1 = -5 \quad x_2 = 2$$

4. Ne rješavajući kvadratnu jednadžbu $10x^2 - 3x - 1 = 0$ izračunaj: (3 boda)

$$\frac{x_1}{x_2} + \frac{x_2}{x_1} = \frac{x_1^2 + x_2^2}{x_2 x_1} = \frac{(x_1 + x_2)^2 + 2x_1x_2}{x_2 x_1}$$

$$10x^2 - 3x - 1 = 0$$

$$x_{1,2} = \frac{3 \pm 7}{20}$$

$$x_1 = \frac{9}{20} \quad x_2 = \frac{1}{5}$$

5. Izračunaj. (6 boda)

$$a) \begin{cases} x+y=1 \Rightarrow x=1-y \\ (x-1)(y-1)=-2 \end{cases}$$

$$(1-y-1)(y-1)=-2$$

$$-y(y-1)=-2$$

$$-y^2+y=-2$$

$$-y^2+y+2=0 \quad | \cdot (-1)$$

$$y^2-y-2=0$$

$$\begin{array}{r} 11 \\ -2 \cdot 2 \end{array}$$

$$y_1=1$$

$$y_2=-2$$

$$x=1-y$$

$$x_1=1-1$$

$$x_1=0$$

$$x=1+2$$

$$x_2=3$$

$$b) \sqrt{6x+1} + 3 = 2x$$

$$\sqrt{6x+1} = 2x-3 \quad |^2$$

$$6x+1 = (2x-3)^2$$

$$6x+1 = 4x^2 - 12x + 9$$

$$6x+1 - 4x^2 + 12x - 9 = 0$$

$$-4x^2 + 18x - 8 = 0 \quad | : -2$$

$$2x^2 - 9x + 4 = 0$$

$$x_{1,2} = \frac{-9 \pm \sqrt{81-32}}{4}$$

$$x_{1,2} = \frac{-9 \pm 7}{4}$$

$$x_1 = \frac{-9-7}{4}$$

$$x_2 = \frac{-9+7}{4}$$

$$x_1 = -4$$

$$x_2 = -\frac{1}{2}$$

6. Riješi sljedeću jednadžbu. (3 boda)

$$3x^4 + 10x^2 + 8 = 0$$

$$t = x^2$$

$$3t^2 + 10t + 8 = 0$$

$$t_{1,2} = \frac{-10 \pm \sqrt{100 - 96}}{6}$$

$$t_{1,2} = \frac{-10 \pm 2}{6}$$

$$t_1 = \frac{-12}{6}$$

$$t_2 = \frac{-8}{6}$$

$$t_1 = -2$$

$$t_2 = -\frac{4}{3}$$

$$x^2 = t$$

$$x^2 = -2 \quad | \sqrt{\quad}$$

$$x_{1,2} = \pm \sqrt{-2} \quad i$$

$$x^2 = -\frac{4}{3} \quad | \sqrt{\quad}$$

$$x = \pm \sqrt{-\frac{4}{3}} \quad i$$

7. Čovimbe Al-a-nur puni bazen dugom cijevima za tri sata. Za punjenje bazena prvom cijevi potrebno mu je 8 sati više nego drugom. Za koje vrijeme svaka cijev sama napuni bazen? (3 boda)

$$x+y=3 \quad (P)$$

$$x=8+y$$

$$x_1 y = 2$$