1. Riješi sljedeće jednadžbe Andrija Eterović, Karlo Cahunek, Marin Gajčetal, Mario Rajković

a) $16x^2 - 12x = 0$

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

$x_1 = 0$

$4x - 3 = 0$

$4x = 3 \mid :4$

$x_2 = \frac{3}{4}$ (+1)

b) $16x^2 + 1 = 0$

$(4x+1)(4x-1) = 0$

$4x + 1 = 0$

$4x = -1 \mid :4$

$x_1 = -\frac{1}{4}$

$4x - 1 = 0$

$4x = 1 \mid :4$

$x = \frac{1}{4}$ (+1)

c) $4x^2 + 1 = 0$

$4x^2 = -1 \mid :4$

$x^2 = -\frac{1}{4} \mid \sqrt{}$

$x = \pm\sqrt{\frac{1}{4}}\,i$

$x = \pm\frac{1}{2}\,i$

(+1)

2. Riješi jednadžbu

$x^2 - 2\sqrt{3}x + 2 = 0$

$x_{1,2} = \frac{-(-2)\cdot\sqrt{3} \pm \sqrt{(-2\sqrt{3})^2 - 4\cdot 1\cdot 2}}{2}$ (+1)

$x_{1,2} = \frac{2\sqrt{3} \pm \sqrt{12 - 8}}{}$

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

$x_1 = \sqrt{3} + 1$

$x_2 = \sqrt{3} - 1$ (+1)

3. Riješi jednadžbu

a) $2(x+3)^2 = 12x + 20 \mid :2$ (+1)

$(x+3)^2 = 6x + 10$

$x^2 + 6x + 9 - 6x - 10 = 0$ (+1)

$x^2 - 1 = 0$

$x^2 = 1 \mid \sqrt{}$

$x = \pm 1$

(+1)

$x_1 = 1$ $x_2 = -1$

b) $\frac{x-1}{2x-1} - \frac{4x-2}{x-1} = 1$

$\frac{x-1}{2x-1} - 2\frac{2x-1}{x-1}$

$t = \frac{x-1}{2x-1}$ (+1)

$t - \frac{2}{t} = 1 \cdot / t \neq 0$

$t^2 - 2 = t$

$t^2 - 2 - t = 0$

$t_{1,2} = \frac{4 \pm \sqrt{4+4}}{2} = \frac{4 \pm 4}{2} =$ (+1)

$t_1 = -1$

$t_2 = 2$

$\frac{x-1}{2x-1} = -1 / \cdot 2x-1 \neq 0$

$x \neq \frac{1}{2}$

$x - 1 = -2x + 1$

$3x = 2 / :3$

$x = \frac{2}{3}$ (+1)

$\frac{x-1}{2x-1} = 2 / \cdot 2x-1 \neq 0$

$x \neq \frac{1}{2}$

$x - 1 = 4x - 2$

$-3x = -1 / :(-3)$

$x = \frac{1}{3}$ (+1)

4. Rješi iracionalne jednadžbe

a) $\sqrt{3x-8} + 2 = x$

$\sqrt{3x-8} = x - 2 / ^2$ (+1)

$3x - 8 = x^2 - 4x + 4$

$x^2 - 7x + 12 = 0$

$-3 \quad -4$

$x_1 = 3$

$x_2 = 4$ (+1)

$\sqrt{3 \cdot 3 - 8} = 3 - 2$

$1 = 1$ ✓ (+1)

$\sqrt{3 \cdot 4 - 8} = 3 - 4$

$2 = -1$ X

5. Rješi sustav jednažbi

$x + y = 1 \rightarrow x = 1 - y$

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

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

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

$-y^2 + y = -2$

$-y^2 + y + 2 = 0 / :(-1)$

$y^2 - y - 2 = 0$ (+1)

$x_{1,2} = \frac{1 \pm \sqrt{1+8}}{2}$

$= \frac{1 \pm 3}{2}$

$y_1 = 2$

$y_2 = -1$ (+1)

$x = 1 - y$

$x_1 = -1$

$x_2 = 2$ (+1)

6. Rješi nejednadžbu

$x_1 \quad x_2 = \frac{c}{a} = \frac{1-p^2}{4p^2}$

$x_1 + x_2 = \frac{2p}{4p^2} = \frac{1}{2p}$ (+1)

$x_1^2 + x_2^2 < 0$

$(x_1+x_2)^2 - 2x_1x_2 < 0$

$\left(\frac{1}{2p}\right)^2 - 2 \cdot \frac{1-p^2}{4p^2} < 0$

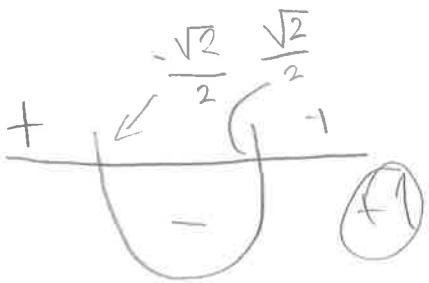
$\frac{1}{4p^2} - \frac{2-2p^2}{4p^2} < 0$

$\frac{1-(2-2p^2)}{4p^2} < 0$

$\frac{1-2+2p^2}{4p^2} < 0$

$\frac{2p^2-1}{4p^2} < 0$

$4p^2 \neq 0 \Rightarrow p \neq 0$ (+1)



(+1)

$2p^2 - 1 < 0$

$2p^2 = 1 \mid :2$

$p^2 = \frac{1}{2} \mid \sqrt{\ }$

$p = \pm\sqrt{\frac{1}{2}}$

$p = \pm\frac{\sqrt{2}}{2}$ (+1)

$p \in \left\langle -\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2} \right\rangle \setminus \{0\}$ (+1)

7. $(k-7)^4 - 13(k-7)^2 + 36 = 0$ Riješi jednadžbu

$t = (k-7)^2$

$t^2 - 13t + 36 = 0$

$t_{1,2} = \frac{13 \pm \sqrt{169-144}}{2}$ (+1)

$= \frac{13 \pm 5}{2}$ (+1)

$t_1 = 9$ (+1)

$(k-7)^2 = 9$

$k^2 - 14k + 49 = 9$

$k^2 - 14k + 40 = 0$

$t_{3,4} = \frac{14 \pm \sqrt{196-160}}{2}$

$= \frac{14 \pm 6}{2}$

$k_1 = 10$

$k_2 = 4$ (+1)

$t_2 = 4$ (+1)

$(k-7)^2 = 4 / \sqrt{}$

$\sqrt{(k-7)^2} = \sqrt{4}$

$|k-7| = 2$

$k-7 = -2$ $\quad k-7 = 2$

$k_3 = 5$ $\quad k_4 = 9$ (+1)

ZADATAK 8. Majstori Rajko i Žarko mogu popraviti klimu za 7 dana. Kad bi Rajko radio sam, taj bi posao obavio za 4 dana brže nego da ga obavlja sam Žarko. Za koliko bi dana klimu popravio Žarko bez ičije pomoći?

Žarko – $\frac{1}{x}$

Rajko $\frac{1}{x-4}$

$\frac{7}{x} + \frac{7}{x-4} = 1 \quad | \cdot (x-4)x$

$7(x-4) + 7x = x(x-4)$

$7x - 49 + 7x = x^2 - 4x$

$-x^2 + 18x - 49 = 0 \quad | \cdot (-1)$

$x^2 - 18x + 49 = 0$

$x_{1,2} = \frac{18 \pm \sqrt{324-196}}{2}$

$= \frac{18 \pm \sqrt{128}}{2}$

$x_1 = \frac{18 + \sqrt{128}}{2}$

$x_2 = \frac{18 - \sqrt{128}}{2}$