

Bodovi: /

Pisana provjera znanja

Grupa:

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① Izračunaj:

a) $14x^2 + x = 0$

b) $10x^2 - 6 = 0$

c) $12x^2 + x + 6 = 0$

② Riješi jednačinu:

$$\frac{x-4}{6} + \frac{(x-2)^2}{8} = \frac{3-x}{5}$$

③ Izračunaj diskriminantu, i opisi prirodu rješenja jednačini.

$$16x^2 - 12x + 1 = 0$$

④ Ne rješavajući kvadratnu jednačinu $3x^2 - 4x - 1 = 0$,
izračunaj:

a) $\frac{1}{x_1} + \frac{1}{x_2}$

b) $x_1^2 + x_2^2$

$$a) 14x^2 + x = 0$$

$$x(14x+1) = 0$$

$$x = 0$$

$$x = -\frac{1}{14} \quad (+)$$

$$b) 10x^2 - 6 = 0$$

$$\sqrt{10}x^2 = 3 \quad | : \sqrt{10}$$

$$x^2 = \frac{3}{\sqrt{10}} \quad | \sqrt{\quad}$$

$$x = \pm \frac{\sqrt{3}}{\sqrt{10}} \cdot \frac{\sqrt{10}}{\sqrt{10}}$$

$$x = \pm \frac{\sqrt{30}}{10} \quad (+)$$

$$c) 12x^2 + x - 6 = 0$$

$$-1 \pm \sqrt{1+288}$$

$$x_{1,2} = \frac{\quad}{24}$$

$$-1 \pm 17 \quad (+)$$

$$x_{1,2} = \frac{\quad}{24}$$

$$x_1 = \frac{16}{24}$$

$$x_2 = -\frac{19}{24}$$

$$\boxed{x_1 = \frac{2}{3}}$$

$$\boxed{x_2 = -\frac{3}{4}}$$

$$2) \frac{x-4}{6} + \frac{(x-2)^2}{8} = \frac{3-x}{5} \quad | \cdot 120$$

$$20(x-4) + 15(x-2)^2 = 24(3-x)$$

$$20x - 80 + 15(x^2 - 4x + 4) = 72 - 24x \quad (+)$$

$$20x - 80 + 15x^2 - 60x + 60 = 72 - 24x$$

$$15x^2 - 16x - 92 = 0$$

$$x_{1,2} = \frac{16 \pm \sqrt{256 + 5520}}{30}$$

$$x_{1,2} = \frac{16 \pm 76}{30} \quad (+)$$

$$x_1 = \frac{92}{30}$$

$$x_2 = -2$$

$$x_1 = \frac{46}{15} \quad (+)$$

4)

$$3x^2 - 4x - 1 = 0$$

$$a) \frac{1}{x_1} + \frac{1}{x_2} = \frac{x_1 + x_2}{x_1 \cdot x_2} = -\frac{4/3}{1/3} = -4$$

$$x_1 \cdot x_2 = -\frac{1}{3} \quad (+)$$

$$x_1 + x_2 = \frac{4}{3}$$

$$\frac{x-4}{2} + \frac{(x-2)^2}{3} = \frac{3-x}{6} \quad | \cdot 6$$

$$3(x-4) + 2(x-2)^2 = 3-x$$

$$3x - 12 + 2(x^2 - 4x + 4) = 3 - x$$

$$3x - 12 + 2x^2 - 8x + 8 = 3 - x$$

$$-4x + 2x^2 - 7 = 0$$

$$2x^2 - 4x - 7 = 0$$

$$x_{1,2} = \frac{4 \pm \sqrt{16 + 56}}{4}$$

$$3) \Delta = 144 - 64$$

$$\Delta > 0 \Rightarrow 2 \text{ R}$$

(+)

$$b) x_1^2 + x_2^2$$

$$= x_1^2 + 2x_1x_2 + x_2^2 - 2x_1x_2 \quad (+)$$

$$= (x_1 + x_2)^2 - 2x_1x_2$$

$$= \left(\frac{4}{3}\right)^2 - 2 \cdot \left(-\frac{1}{3}\right)$$

$$= \frac{16}{9} + \frac{2}{3} \quad (+)$$

$$\boxed{= \frac{22}{9}}$$

RJEŠENJA

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1. a) $x_1 = 0$ $x_2 = \frac{1}{14}$

b) $\pm \frac{\sqrt{15}}{5}$ $x_1 = \frac{\sqrt{15}}{5}$ $x_2 = -\frac{\sqrt{15}}{5}$

c) $x_{1,2} = \frac{-1 \pm \sqrt{207}i}{24}$

2. $x_1 = \frac{46}{15}$ $x_2 = -2$

3. $D = 144 - 64$ $D > 0 \Rightarrow 2/\mathbb{R}$

4. a) -4

b) $\frac{22}{9}$

5. $x_{1,2} = \pm \frac{1}{2}$

$x_{3,4} = \pm 3$

6.) $a = 17$
 $b = 12$