Zadatak 121 (Marino i Medax, srednja škola)

Koliko je x + y ako vrijedi: $\begin{cases} |x|+x+y=5 \\ x+|y|-y=10 \end{cases}$?

A. 1 *B.* 2 *C.* 3 *D.* 4 *E.* 5

Rješenje 121

Ponovimo!

Za realni broj x njegova je apsolutna vrijednost (modul) broj $|x|$ koji određujemo na ovaj način:

$$|x|=\begin{cases} x,\ x\geq 0 \\ -x,\ x<0. \end{cases}$$

Ako je broj x pozitivan ili nula, tada je on jednak svojoj apsolutnoj vrijednosti. Za svaki x, $x \geq 0$, vrijedi $|x| = x$.

Ako je x negativan broj, njegova apsolutna vrijednost je suprotan broj – x koji je pozitivan. Za svaki x, $x < 0$, je $|x| = -x$.

Postoje četiri slučaja!

Prvi slučaj

$$\left.\begin{matrix} x\geq 0 \\ y\geq 0 \end{matrix}\right\} \Rightarrow \left[\begin{matrix} |x|+x+y=5 \\ x+|y|-y=10 \end{matrix}\right] \Rightarrow \left.\begin{matrix} x+x+y=5 \\ x+y-y=10 \end{matrix}\right\} \Rightarrow \left.\begin{matrix} 2\cdot x+y=5 \\ x+y-y=10 \end{matrix}\right\} \Rightarrow$$

$$\Rightarrow \left.\begin{matrix} 2\cdot x+y=5 \\ x=10 \end{matrix}\right\} \Rightarrow \left[\begin{matrix} \text{metoda} \\ \text{zamjene} \end{matrix}\right] \Rightarrow \left.\begin{matrix} 2\cdot 10+y=5 \\ x=10 \end{matrix}\right\} \Rightarrow \left.\begin{matrix} 20+y=5 \\ x=10 \end{matrix}\right\} \Rightarrow$$

$$\Rightarrow \left.\begin{matrix} y=5-20 \\ x=10 \end{matrix}\right\} \Rightarrow \left.\begin{matrix} y=-15 \\ x=10 \end{matrix}\right\} \Rightarrow \left[\begin{matrix} \text{nema rješenja zbog} \\ y\geq 0 \end{matrix}\right].$$

Drugi slučaj

$$\left.\begin{matrix} x\geq 0 \\ y<0 \end{matrix}\right\} \Rightarrow \left[\begin{matrix} |x|+x+y=5 \\ x+|y|-y=10 \end{matrix}\right] \Rightarrow \left.\begin{matrix} x+x+y=5 \\ x-y-y=10 \end{matrix}\right\} \Rightarrow \left.\begin{matrix} 2\cdot x+y=5 \\ x-2\cdot y=10 \end{matrix}\right\} \Rightarrow \left[\begin{matrix} \text{metoda suprotnih} \\ \text{koeficijenata} \end{matrix}\right] \Rightarrow$$

$$\Rightarrow \left.\begin{matrix} 2\cdot x+y=5\ /\cdot 2 \\ x-2\cdot y=10 \end{matrix}\right\} \Rightarrow \left.\begin{matrix} 4\cdot 10+2\cdot y=10 \\ x-2\cdot y=10 \end{matrix}\right\} \Rightarrow 5\cdot x=20 \Rightarrow 5\cdot x=20\ /:5 \Rightarrow x=4.$$

Računamo y.

$$\left.\begin{matrix} 2\cdot x+y=5 \\ x=4 \end{matrix}\right\} \Rightarrow \left[\begin{matrix} \text{metoda} \\ \text{zamjene} \end{matrix}\right] \Rightarrow 2\cdot 4+y=5 \Rightarrow 8+y=5 \Rightarrow y=5-8 \Rightarrow y=-3.$$

Dakle, rješenje je

$$(x,\ y)=(4,\ -3)$$

pa je

$$x+y=4+(-3)=1.$$

Odgovor je pod A

Treća slučaj

$$\left.\begin{matrix} x<0 \\ y\geq 0 \end{matrix}\right\} \Rightarrow \left[\begin{matrix} |x|+x+y=5 \\ x+|y|-y=10 \end{matrix}\right] \Rightarrow \left.\begin{matrix} -x+x+y=5 \\ x+y-y=10 \end{matrix}\right\} \Rightarrow \left.\begin{matrix} -x+x+y=5 \\ x+y-y=10 \end{matrix}\right\} \Rightarrow$$

$$\Rightarrow \left.\begin{matrix} y=5 \\ x=10 \end{matrix}\right\} \Rightarrow \left[\begin{matrix} \text{nema rješenja zbog} \\ x<0 \end{matrix}\right].$$

Četvrti slučaj

$$\left.\begin{array}{l} x<0 \\ y<0 \end{array}\right\} \Rightarrow \left[\begin{array}{l} |x|+x+y=5 \\ x+|y|-y=10 \end{array}\right] \Rightarrow \left.\begin{array}{l} -x+x+y=5 \\ x-y-y=10 \end{array}\right\} \Rightarrow \left.\begin{array}{l} -x+x+y=5 \\ x-2\cdot y=10 \end{array}\right\} \Rightarrow$$

$$\Rightarrow \left.\begin{array}{l} y=5 \\ x-2\cdot y=10 \end{array}\right\} \Rightarrow \left[\begin{array}{c} \text{nema rješenja zbog} \\ y<0 \end{array}\right].$$

Vježba 121

Koliko je x + y ako vrijedi: $\begin{cases} |x|+x+y-5=0 \\ x+|y|-y-10=0 \end{cases}$?

A. 1 *B.* 2 *C.* 3 *D.* 4 *E.* 5

Rezultat: A.

Zadatak 122 (Tomislav, srednja škola)

Ako je $a+b=5,\ b+c=7,\ c+a=6$, koliko je $a\cdot b\cdot c$?

Rješenje 122

Ponovimo!

$$\left.\begin{array}{l} a=b \\ c=d \end{array}\right\} \Rightarrow a+c=b+d.$$

Zakon distribucije množenja prema zbrajanju.

$$a\cdot(b+c)=a\cdot b+a\cdot c \quad , \quad a\cdot b+a\cdot c=a\cdot(b+c).$$

1.inačica

$$\left.\begin{array}{l} a+b=5 \\ b+c=7 \\ c+a=6 \end{array}\right\} \Rightarrow \left.\begin{array}{l} a+b=5 \\ b=7-c \\ a=6-c \end{array}\right\} \Rightarrow \left[\begin{array}{c} \text{metoda} \\ \text{zamjene} \end{array}\right] \Rightarrow (6-c)+(7-c)=5 \Rightarrow 6-c+7-c=5 \Rightarrow$$

$$\Rightarrow -c-c=5-6-7 \Rightarrow -2\cdot c=-8 \Rightarrow -2\cdot c=-8 \ /:(-2) \Rightarrow c=4.$$

Računamo a i b.

$$\left.\begin{array}{l} a=6-c \\ b=7-c \end{array}\right\} \Rightarrow [\,c=4\,] \Rightarrow \left.\begin{array}{l} a=6-4 \\ b=7-4 \end{array}\right\} \Rightarrow \left.\begin{array}{l} a=2 \\ b=3 \end{array}\right\}.$$

Konačno je

$$a\cdot b\cdot c=2\cdot 3\cdot 4 \Rightarrow a\cdot b\cdot c=24.$$

2.inačica

$$\left.\begin{array}{l} a+b=5 \\ b+c=7 \\ c+a=6 \end{array}\right\} \Rightarrow \left[\begin{array}{c} \text{zbrojimo} \\ \text{jednadžbe} \end{array}\right] \Rightarrow a+b+b+c+c+a=5+7+6 \Rightarrow 2\cdot a+2\cdot b+2\cdot c=18 \Rightarrow$$

$$\Rightarrow 2\cdot(a+b+c)=18 \Rightarrow 2\cdot(a+b+c)=18 \ /:2 \Rightarrow a+b+c=9.$$

Računamo a.

$$\left.\begin{array}{l} b+c=7 \\ a+b+c=9 \end{array}\right\} \Rightarrow \left.\begin{array}{l} b+c=7 \\ a+(b+c)=9 \end{array}\right\} \Rightarrow \left[\begin{array}{c} \text{metoda} \\ \text{zamjene} \end{array}\right] \Rightarrow a+7=9 \Rightarrow a=9-7 \Rightarrow a=2.$$

Računamo b i c.

$$\left.\begin{array}{l} a+b=5 \\ c+a=6 \end{array}\right\} \Rightarrow \left.\begin{array}{l} b=5-a \\ c=6-a \end{array}\right\} \Rightarrow [\,a=2\,] \Rightarrow \left.\begin{array}{l} b=5-2 \\ c=6-2 \end{array}\right\} \Rightarrow \left.\begin{array}{l} b=3 \\ c=4 \end{array}\right\}.$$

Konačno je

$$a\cdot b\cdot c=2\cdot 3\cdot 4 \Rightarrow a\cdot b\cdot c=24.$$

Vježba 122

Ako je $a+b=3,\ b+c=5,\ c+a=4$, koliko je $a\cdot b\cdot c$?

Rezultat: 6.

Zadatak 123 (Valentina, gimnazija)

Ako je $2\cdot x^2+5\cdot y^2+z^2-4\cdot x\cdot y+2\cdot x\cdot z+2\cdot y+1=0$, koliko je $x+y+z$?

Rješenje 123

Ponovimo!

$$(a\cdot b)^n=a^n\cdot b^n \quad , \quad a^2-2\cdot a\cdot b+b^2=(a-b)^2 \quad , \quad a^2+2\cdot a\cdot b+b^2=(a+b)^2.$$

$$a^2+b^2=0 \Rightarrow \left.\begin{matrix} a=0 \\ b=0 \end{matrix}\right\}.$$

Zakon distribucije množenja prema zbrajanju.

$$a\cdot(b+c)=a\cdot b+a\cdot c \quad , \quad a\cdot b+a\cdot c=a\cdot(b+c).$$

Preoblikujemo zadanu jednadžbu.

$$2\cdot x^2+5\cdot y^2+z^2-4\cdot x\cdot y+2\cdot x\cdot z+2\cdot y+1=0 \Rightarrow$$

$$\Rightarrow x^2-4\cdot x\cdot y+4\cdot y^2+x^2+2\cdot x\cdot z+z^2+y^2+2\cdot y+1=0 \Rightarrow$$

$$\Rightarrow \left(x^2-4\cdot x\cdot y+4\cdot y^2\right)+\left(x^2+2\cdot x\cdot z+z^2\right)+\left(y^2+2\cdot y+1\right)=0 \Rightarrow$$

$$\Rightarrow (x-2\cdot y)^2+(x+z)^2+(y+1)^2=0 \Rightarrow \left.\begin{matrix} x-2\cdot y=0 \\ x+z=0 \\ y+1=0 \end{matrix}\right\} \Rightarrow \left.\begin{matrix} x=2\cdot y \\ x=-z \\ y=-1 \end{matrix}\right\} \Rightarrow \left.\begin{matrix} x=2\cdot(-1) \\ x=-z \\ y=-1 \end{matrix}\right\} \Rightarrow$$

$$\Rightarrow \left.\begin{matrix} x=-2 \\ x=-z \\ y=-1 \end{matrix}\right\} \Rightarrow \left.\begin{matrix} x=-2 \\ z=-x \\ y=-1 \end{matrix}\right\} \Rightarrow \left.\begin{matrix} x=-2 \\ z=-(-2) \\ y=-1 \end{matrix}\right\} \Rightarrow \left.\begin{matrix} x=-2 \\ z=2 \\ y=-1 \end{matrix}\right\}.$$

Sada je:

$$x+y+z=-2-1+2 \Rightarrow x+y+z=-2-1+2 \Rightarrow x+y+z=-1.$$

Vježba 123

Ako je $2\cdot x^2+5\cdot y^2+z^2-4\cdot x\cdot y+2\cdot x\cdot z+2\cdot y-8=0$, koliko je $x+y+z$?

Rezultat: 3.

Zadatak 124 (Vegy, gimnazija)

Neka je $x^2=1+x$. Ako je $x^{10}=a+b\cdot x$, onda je $a+b$ jednako:

A. 85 *B.* 86 *C.* 87 *D.* 88 *E.* 89

Rješenje 124

Ponovimo!

$$\left(a^n\right)^m=a^{n\cdot m} \quad , \quad (a+b)^2=a^2+2\cdot a\cdot b+b^2 \quad , \quad (a-b)^2=a^2-2\cdot a\cdot b+b^2.$$

$$\left(\sqrt{a}\right)^2=a \quad , \quad a^n\cdot a^m=a^{n+m} \quad , \quad a^1=a \quad , \quad (a\cdot b)^n=a^n\cdot b^n \quad , \quad \frac{a}{b}\cdot\frac{c}{d}=\frac{a\cdot c}{b\cdot d}.$$

$$n=\frac{n}{1} \quad , \quad \left(\frac{a}{b}\right)^n=\frac{a^n}{b^n} \quad , \quad \left.\begin{matrix} a=b \\ c=d \end{matrix}\right\} \Rightarrow a-c=b-d \quad , \quad \frac{a}{n}-\frac{b}{n}=\frac{a-b}{n}.$$

$$\frac{a}{n}+\frac{b}{n}=\frac{a+b}{n}.$$

Zakon distribucije množenja prema zbrajanju.

$$a\cdot(b+c)=a\cdot b+a\cdot c \quad , \quad a\cdot b+a\cdot c=a\cdot(b+c).$$

Množenje zagrada

$$(a+b)\cdot(c+d)=a\cdot c+a\cdot d+b\cdot c+b\cdot d.$$

Skratiti razlomak znači brojnik i nazivnik tog razlomka podijeliti istim brojem različitim od nule i jedinice

$$\frac{a\cdot n}{b\cdot n}=\frac{a}{b} \quad , \quad n\neq 0 \quad , \quad n\neq 1.$$

Nađemo prvo rješenja kvadratne jednadžbe.

$$x^2=1+x \Rightarrow x^2-x-1=0 \Rightarrow \left.\begin{matrix} x^2-x-1=0 \\ a=1\ ,\ b=-1\ ,\ c=-1 \end{matrix}\right\} \Rightarrow$$

$$\Rightarrow \left.\begin{matrix} a=1\ ,\ b=-1\ ,\ c=-1 \\ x_{1,2}=\dfrac{-b\pm\sqrt{b^2-4\cdot a\cdot c}}{2\cdot a} \end{matrix}\right\} \Rightarrow x_{1,2}=\frac{-(-1)\pm\sqrt{(-1)^2-4\cdot 1\cdot(-1)}}{2\cdot 1} \Rightarrow$$

$$\Rightarrow x_{1,2}=\frac{1\pm\sqrt{1+4}}{2} \Rightarrow x_{1,2}=\frac{1\pm\sqrt{5}}{2} \Rightarrow \left.\begin{matrix} x_1=\dfrac{1+\sqrt{5}}{2} \\ x_2=\dfrac{1-\sqrt{5}}{2} \end{matrix}\right\}.$$

Uvrstimo vrijednosti x_1 i x_2 u drugu jednadžbu

$$x^{10}=a+b\cdot x.$$

- $$\left.\begin{matrix} x=\dfrac{1+\sqrt{5}}{2} \\ x^{10}=a+b\cdot x \end{matrix}\right\} \Rightarrow \left(\frac{1+\sqrt{5}}{2}\right)^{10}=a+b\cdot\frac{1+\sqrt{5}}{2} \Rightarrow$$

$$\Rightarrow \left(\left(\frac{1+\sqrt{5}}{2}\right)^2\right)^5=a+b\cdot\frac{1+\sqrt{5}}{2} \Rightarrow \left(\frac{1+2\cdot\sqrt{5}+\left(\sqrt{5}\right)^2}{4}\right)^5=a+b\cdot\frac{1+\sqrt{5}}{2} \Rightarrow$$

$$\Rightarrow \left(\frac{1+2\cdot\sqrt{5}+5}{4}\right)^5=a+b\cdot\frac{1+\sqrt{5}}{2} \Rightarrow \left(\frac{6+2\cdot\sqrt{5}}{4}\right)^5=a+b\cdot\frac{1+\sqrt{5}}{2} \Rightarrow$$

$$\Rightarrow \left(\frac{2\cdot\left(3+\sqrt{5}\right)}{4}\right)^5=a+b\cdot\frac{1+\sqrt{5}}{2} \Rightarrow \left(\frac{2\cdot\left(3+\sqrt{5}\right)}{4}\right)^5=a+b\cdot\frac{1+\sqrt{5}}{2} \Rightarrow$$

$$\Rightarrow \left(\frac{3+\sqrt{5}}{2}\right)^5=a+b\cdot\frac{1+\sqrt{5}}{2} \Rightarrow \left(\frac{3+\sqrt{5}}{2}\right)^4\cdot\left(\frac{3+\sqrt{5}}{2}\right)^1=a+b\cdot\frac{1+\sqrt{5}}{2} \Rightarrow$$

$$\Rightarrow \left(\left(\frac{3+\sqrt{5}}{2}\right)^2\right)^2 \cdot \frac{3+\sqrt{5}}{2} = a+b\cdot\frac{1+\sqrt{5}}{2} \Rightarrow$$

$$\Rightarrow \left(\frac{9+6\cdot\sqrt{5}+\left(\sqrt{5}\right)^2}{4}\right)^2 \cdot \frac{3+\sqrt{5}}{2} = a+b\cdot\frac{1+\sqrt{5}}{2} \Rightarrow$$

$$\Rightarrow \left(\frac{9+6\cdot\sqrt{5}+5}{4}\right)^2 \cdot \frac{3+\sqrt{5}}{2} = a+b\cdot\frac{1+\sqrt{5}}{2} \Rightarrow$$

$$\Rightarrow \left(\frac{14+6\cdot\sqrt{5}}{4}\right)^2 \cdot \frac{3+\sqrt{5}}{2} = a+b\cdot\frac{1+\sqrt{5}}{2} \Rightarrow \left(\frac{2\cdot\left(7+3\cdot\sqrt{5}\right)}{4}\right)^2 \cdot \frac{3+\sqrt{5}}{2} = a+b\cdot\frac{1+\sqrt{5}}{2} \Rightarrow$$

$$\Rightarrow \left(\frac{2\cdot\left(7+3\cdot\sqrt{5}\right)}{4}\right)^2 \cdot \frac{3+\sqrt{5}}{2} = a+b\cdot\frac{1+\sqrt{5}}{2} \Rightarrow \left(\frac{7+3\cdot\sqrt{5}}{2}\right)^2 \cdot \frac{3+\sqrt{5}}{2} = a+b\cdot\frac{1+\sqrt{5}}{2} \Rightarrow$$

$$\Rightarrow \frac{49+2\cdot7\cdot3\cdot\sqrt{5}+\left(3\cdot\sqrt{5}\right)^2}{4} \cdot \frac{3+\sqrt{5}}{2} = a+b\cdot\frac{1+\sqrt{5}}{2} \Rightarrow$$

$$\Rightarrow \frac{49+42\cdot\sqrt{5}+3^2\cdot\left(\sqrt{5}\right)^2}{4} \cdot \frac{3+\sqrt{5}}{2} = a+b\cdot\frac{1+\sqrt{5}}{2} \Rightarrow$$

$$\Rightarrow \frac{49+42\cdot\sqrt{5}+9\cdot5}{4} \cdot \frac{3+\sqrt{5}}{2} = a+b\cdot\frac{1+\sqrt{5}}{2} \Rightarrow \frac{49+42\cdot\sqrt{5}+45}{4} \cdot \frac{3+\sqrt{5}}{2} = a+b\cdot\frac{1+\sqrt{5}}{2} \Rightarrow$$

$$\Rightarrow \frac{94+42\cdot\sqrt{5}}{4} \cdot \frac{3+\sqrt{5}}{2} = a+b\cdot\frac{1+\sqrt{5}}{2} \Rightarrow \frac{2\cdot\left(47+21\cdot\sqrt{5}\right)}{4} \cdot \frac{3+\sqrt{5}}{2} = a+b\cdot\frac{1+\sqrt{5}}{2} \Rightarrow$$

$$\Rightarrow \frac{2\cdot\left(47+21\cdot\sqrt{5}\right)}{4} \cdot \frac{3+\sqrt{5}}{2} = a+b\cdot\frac{1+\sqrt{5}}{2} \Rightarrow \frac{47+21\cdot\sqrt{5}}{2} \cdot \frac{3+\sqrt{5}}{2} = a+b\cdot\frac{1+\sqrt{5}}{2} \Rightarrow$$

$$\Rightarrow \frac{\left(47+21\cdot\sqrt{5}\right)\cdot\left(3+\sqrt{5}\right)}{4} = a+b\cdot\frac{1+\sqrt{5}}{2} \Rightarrow$$

$$\Rightarrow \frac{141+47\cdot\sqrt{5}+63\cdot\sqrt{5}+21\cdot\left(\sqrt{5}\right)^2}{4} = a+b\cdot\frac{1+\sqrt{5}}{2} \Rightarrow$$

$$\Rightarrow \frac{141+47\cdot\sqrt{5}+63\cdot\sqrt{5}+21\cdot5}{4} = a+b\cdot\frac{1+\sqrt{5}}{2} \Rightarrow \frac{141+47\cdot\sqrt{5}+63\cdot\sqrt{5}+105}{4} = a+b\cdot\frac{1+\sqrt{5}}{2} \Rightarrow$$

$$\Rightarrow \frac{246+110\cdot\sqrt{5}}{4} = a+b\cdot\frac{1+\sqrt{5}}{2} \Rightarrow \frac{2\cdot\left(123+55\cdot\sqrt{5}\right)}{4} = a+b\cdot\frac{1+\sqrt{5}}{2} \Rightarrow$$

$$\Rightarrow \frac{2\cdot\left(123+55\cdot\sqrt{5}\right)}{4}=a+b\cdot\frac{1+\sqrt{5}}{2} \Rightarrow \frac{123+55\cdot\sqrt{5}}{2}=a+b\cdot\frac{1+\sqrt{5}}{2} \Rightarrow$$

$$\Rightarrow \frac{123}{2}+\frac{55\cdot\sqrt{5}}{2}=a+b\cdot\frac{1+\sqrt{5}}{2}.$$

- $\left.\begin{array}{l} x=\dfrac{1-\sqrt{5}}{2} \\ x^{10}=a+b\cdot x \end{array}\right\} \Rightarrow \left(\frac{1-\sqrt{5}}{2}\right)^{10}=a+b\cdot\frac{1-\sqrt{5}}{2} \Rightarrow$

$$\Rightarrow \left(\left(\frac{1-\sqrt{5}}{2}\right)^{2}\right)^{5}=a+b\cdot\frac{1-\sqrt{5}}{2} \Rightarrow \left(\frac{1-2\cdot\sqrt{5}+\left(\sqrt{5}\right)^{2}}{4}\right)^{5}=a+b\cdot\frac{1-\sqrt{5}}{2} \Rightarrow$$

$$\Rightarrow \left(\frac{1-2\cdot\sqrt{5}+5}{4}\right)^{5}=a+b\cdot\frac{1-\sqrt{5}}{2} \Rightarrow \left(\frac{6-2\cdot\sqrt{5}}{4}\right)^{5}=a+b\cdot\frac{1-\sqrt{5}}{2} \Rightarrow$$

$$\Rightarrow \left(\frac{2\cdot\left(3-\sqrt{5}\right)}{4}\right)^{5}=a+b\cdot\frac{1-\sqrt{5}}{2} \Rightarrow \left(\frac{2\cdot\left(3-\sqrt{5}\right)}{4}\right)^{5}=a+b\cdot\frac{1-\sqrt{5}}{2} \Rightarrow$$

$$\Rightarrow \left(\frac{3-\sqrt{5}}{2}\right)^{5}=a+b\cdot\frac{1-\sqrt{5}}{2} \Rightarrow \left(\frac{3-\sqrt{5}}{2}\right)^{4}\cdot\left(\frac{3-\sqrt{5}}{2}\right)^{1}=a+b\cdot\frac{1-\sqrt{5}}{2} \Rightarrow$$

$$\Rightarrow \left(\left(\frac{3-\sqrt{5}}{2}\right)^{2}\right)^{2}\cdot\frac{3-\sqrt{5}}{2}=a+b\cdot\frac{1-\sqrt{5}}{2} \Rightarrow$$

$$\Rightarrow \left(\frac{9-6\cdot\sqrt{5}+\left(\sqrt{5}\right)^{2}}{4}\right)^{2}\cdot\frac{3-\sqrt{5}}{2}=a+b\cdot\frac{1-\sqrt{5}}{2} \Rightarrow$$

$$\Rightarrow \left(\frac{9-6\cdot\sqrt{5}+5}{4}\right)^{2}\cdot\frac{3-\sqrt{5}}{2}=a+b\cdot\frac{1-\sqrt{5}}{2} \Rightarrow$$

$$\Rightarrow \left(\frac{14-6\cdot\sqrt{5}}{4}\right)^{2}\cdot\frac{3-\sqrt{5}}{2}=a+b\cdot\frac{1-\sqrt{5}}{2} \Rightarrow \left(\frac{2\cdot\left(7-3\cdot\sqrt{5}\right)}{4}\right)^{2}\cdot\frac{3-\sqrt{5}}{2}=a+b\cdot\frac{1-\sqrt{5}}{2} \Rightarrow$$

$$\Rightarrow \left(\frac{2\cdot\left(7-3\cdot\sqrt{5}\right)}{4}\right)^{2}\cdot\frac{3-\sqrt{5}}{2}=a+b\cdot\frac{1-\sqrt{5}}{2} \Rightarrow \left(\frac{7-3\cdot\sqrt{5}}{2}\right)^{2}\cdot\frac{3-\sqrt{5}}{2}=a+b\cdot\frac{1-\sqrt{5}}{2} \Rightarrow$$

$$\Rightarrow \frac{49-2\cdot7\cdot3\cdot\sqrt{5}+\left(3\cdot\sqrt{5}\right)^{2}}{4}\cdot\frac{3-\sqrt{5}}{2}=a+b\cdot\frac{1-\sqrt{5}}{2} \Rightarrow$$

$$\Rightarrow \frac{49-42\cdot\sqrt{5}+3^2\cdot\left(\sqrt{5}\right)^2}{4}\cdot\frac{3-\sqrt{5}}{2}=a+b\cdot\frac{1-\sqrt{5}}{2}\Rightarrow$$

$$\Rightarrow \frac{49-42\cdot\sqrt{5}+9\cdot 5}{4}\cdot\frac{3-\sqrt{5}}{2}=a+b\cdot\frac{1-\sqrt{5}}{2}\Rightarrow \frac{49-42\cdot\sqrt{5}+45}{4}\cdot\frac{3-\sqrt{5}}{2}=a+b\cdot\frac{1-\sqrt{5}}{2}\Rightarrow$$

$$\Rightarrow \frac{94-42\cdot\sqrt{5}}{4}\cdot\frac{3-\sqrt{5}}{2}=a+b\cdot\frac{1-\sqrt{5}}{2}\Rightarrow \frac{2\cdot\left(47-21\cdot\sqrt{5}\right)}{4}\cdot\frac{3-\sqrt{5}}{2}=a+b\cdot\frac{1-\sqrt{5}}{2}\Rightarrow$$

$$\Rightarrow \frac{2\cdot\left(47-21\cdot\sqrt{5}\right)}{4}\cdot\frac{3-\sqrt{5}}{2}=a+b\cdot\frac{1-\sqrt{5}}{2}\Rightarrow \frac{47-21\cdot\sqrt{5}}{2}\cdot\frac{3-\sqrt{5}}{2}=a+b\cdot\frac{1-\sqrt{5}}{2}\Rightarrow$$

$$\Rightarrow \frac{\left(47-21\cdot\sqrt{5}\right)\cdot\left(3-\sqrt{5}\right)}{4}=a+b\cdot\frac{1-\sqrt{5}}{2}\Rightarrow$$

$$\Rightarrow \frac{141-47\cdot\sqrt{5}-63\cdot\sqrt{5}+21\cdot\left(\sqrt{5}\right)^2}{4}=a+b\cdot\frac{1-\sqrt{5}}{2}\Rightarrow$$

$$\Rightarrow \frac{141-47\cdot\sqrt{5}-63\cdot\sqrt{5}+21\cdot 5}{4}=a+b\cdot\frac{1-\sqrt{5}}{2}\Rightarrow \frac{141-47\cdot\sqrt{5}-63\cdot\sqrt{5}+105}{4}=a+b\cdot\frac{1-\sqrt{5}}{2}\Rightarrow$$

$$\Rightarrow \frac{246-110\cdot\sqrt{5}}{4}=a+b\cdot\frac{1-\sqrt{5}}{2}\Rightarrow \frac{2\cdot\left(123-55\cdot\sqrt{5}\right)}{4}=a+b\cdot\frac{1-\sqrt{5}}{2}\Rightarrow$$

$$\Rightarrow \frac{2\cdot\left(123-55\cdot\sqrt{5}\right)}{4}=a+b\cdot\frac{1-\sqrt{5}}{2}\Rightarrow \frac{123-55\cdot\sqrt{5}}{2}=a+b\cdot\frac{1-\sqrt{5}}{2}\Rightarrow$$

$$\Rightarrow \frac{123}{2}\frac{55\cdot\sqrt{5}}{2}=a+b\cdot\frac{1-\sqrt{5}}{2}.$$

Dobili smo sustav jednadžbi:

$$\left.\begin{aligned}\frac{123}{2}+\frac{55\cdot\sqrt{5}}{2}&=a+b\cdot\frac{1+\sqrt{5}}{2}\\ \frac{123}{2}-\frac{55\cdot\sqrt{5}}{2}&=a+b\cdot\frac{1-\sqrt{5}}{2}\end{aligned}\right\}\Rightarrow\left[\begin{array}{l}\text{od prve jednadžbe}\\ \text{oduzmemo drugu}\end{array}\right]\Rightarrow$$

$$\Rightarrow \frac{123}{2}+\frac{55\cdot\sqrt{5}}{2}-\left(\frac{123}{2}-\frac{55\cdot\sqrt{5}}{2}\right)=a+b\cdot\frac{1+\sqrt{5}}{2}-\left(a+b\cdot\frac{1-\sqrt{5}}{2}\right)\Rightarrow$$

$$\Rightarrow \frac{123}{2}+\frac{55\cdot\sqrt{5}}{2}-\frac{123}{2}+\frac{55\cdot\sqrt{5}}{2}=a+b\cdot\frac{1+\sqrt{5}}{2}-a-b\cdot\frac{1-\sqrt{5}}{2}\Rightarrow$$

$$\Rightarrow \frac{123}{2}+\frac{55\cdot\sqrt{5}}{2}-\frac{123}{2}+\frac{55\cdot\sqrt{5}}{2}=a+b\cdot\frac{1+\sqrt{5}}{2}-a-b\cdot\frac{1-\sqrt{5}}{2}\Rightarrow$$

$$\Rightarrow \frac{55\cdot\sqrt{5}}{2}+\frac{55\cdot\sqrt{5}}{2}=b\cdot\frac{1+\sqrt{5}}{2}-b\cdot\frac{1-\sqrt{5}}{2}\Rightarrow$$

$$\Rightarrow \frac{55\cdot\sqrt{5}}{2}+\frac{55\cdot\sqrt{5}}{2}=b\cdot\frac{1+\sqrt{5}}{2}-b\cdot\frac{1-\sqrt{5}}{2}\ /\cdot 2\Rightarrow$$

$$\Rightarrow 55\cdot\sqrt{5}+55\cdot\sqrt{5}=b\cdot\left(1+\sqrt{5}\right)-b\cdot\left(1-\sqrt{5}\right)\Rightarrow$$

$$\Rightarrow 110\cdot\sqrt{5}=b+b\cdot\sqrt{5}-b+b\cdot\sqrt{5}\Rightarrow 110\cdot\sqrt{5}=b+b\cdot\sqrt{5}-b+b\cdot\sqrt{5}\Rightarrow$$

$$\Rightarrow 110\cdot\sqrt{5}=b+b\cdot\sqrt{5}-b+b\cdot\sqrt{5}\Rightarrow 110\cdot\sqrt{5}=b\cdot\sqrt{5}+b\cdot\sqrt{5}\Rightarrow$$

$$\Rightarrow 110\cdot\sqrt{5}=2\cdot b\cdot\sqrt{5}\Rightarrow 2\cdot b\cdot\sqrt{5}=110\cdot\sqrt{5}\Rightarrow 2\cdot b\cdot\sqrt{5}=110\cdot\sqrt{5}\ /\cdot\frac{1}{2\cdot\sqrt{5}}\Rightarrow b=55.$$

Računamo nepoznanicu a.

$$\left.\begin{array}{l} b=55 \\ \dfrac{123}{2}+\dfrac{55\cdot\sqrt{5}}{2}=a+b\cdot\dfrac{1+\sqrt{5}}{2}\end{array}\right\}\Rightarrow \frac{123}{2}+\frac{55\cdot\sqrt{5}}{2}=a+55\cdot\frac{1+\sqrt{5}}{2}\Rightarrow$$

$$\Rightarrow \frac{123}{2}+\frac{55\cdot\sqrt{5}}{2}=a+\frac{55}{1}\cdot\frac{1+\sqrt{5}}{2}\Rightarrow \frac{123}{2}+\frac{55\cdot\sqrt{5}}{2}=a+\frac{55+55\cdot\sqrt{5}}{2}\Rightarrow$$

$$\Rightarrow a+\frac{55+55\cdot\sqrt{5}}{2}=\frac{123}{2}+\frac{55\cdot\sqrt{5}}{2}\Rightarrow a+\frac{55}{2}+\frac{55\cdot\sqrt{5}}{2}=\frac{123}{2}+\frac{55\cdot\sqrt{5}}{2}\Rightarrow$$

$$\Rightarrow a+\frac{55}{2}+\frac{55\cdot\sqrt{5}}{2}=\frac{123}{2}+\frac{55\cdot\sqrt{5}}{2}\Rightarrow a+\frac{55}{2}=\frac{123}{2}\Rightarrow a=\frac{123}{2}-\frac{55}{2}\Rightarrow a=\frac{123-55}{2}\Rightarrow$$

$$\Rightarrow a=\frac{68}{2}\Rightarrow a=\frac{68}{2}\Rightarrow a=34.$$

Rješenje zadatka glasi:

$$a+b=34+55\Rightarrow a+b=89.$$

Odgovor je pod E.

Vježba 124

Neka je $x^2=1+x$. Ako je $x^{10}=a+b\cdot x$, onda je $b-a$ jednako:

A. 19 *B.* 20 *C.* 21 *D.* 22 *E.* 23

Rezultat: C.

Zadatak 125 (Karlo, gimnazija)

Riješi sustav jednadžbi: $\left\{\begin{array}{l} x^2-y\cdot z=y-x \\ y^2-x\cdot z=z-y \\ z^2-x\cdot y=x-z\end{array}\right.$.

Rješenje 125

Ponovimo!

$$\left.\begin{array}{l} a=b \\ c=d\end{array}\right\}\Rightarrow a+c=b+d\quad,\quad (a-b)^2=a^2-2\cdot a\cdot b+b^2\quad,\quad a^2+b^2=0\Rightarrow a=b=0.$$

$$\left.\begin{array}{l} x^2-y\cdot z=y-x \\ y^2-x\cdot z=z-y \\ z^2-x\cdot y=x-z\end{array}\right\}\Rightarrow\left[\begin{array}{l}\text{zbrojimo} \\ \text{jednadžbe}\end{array}\right]\Rightarrow$$

$$\Rightarrow x^2-y\cdot z+y^2-x\cdot z+z^2-x\cdot y=y-x+z-y+x-z\Rightarrow$$

$$\Rightarrow x^2 - y\cdot z + y^2 - x\cdot z + z^2 - x\cdot y = y - x + z - y + x - z \Rightarrow$$

$$\Rightarrow x^2 - y\cdot z + y^2 - x\cdot z + z^2 - x\cdot y = 0 \Rightarrow x^2 + y^2 + z^2 - x\cdot y - x\cdot z - y\cdot z = 0 \Rightarrow$$

$$\Rightarrow x^2 + y^2 + z^2 - x\cdot y - x\cdot z - y\cdot z = 0 \ /\cdot 2 \Rightarrow$$

$$\Rightarrow 2\cdot x^2 + 2\cdot y^2 + 2\cdot z^2 - 2\cdot x\cdot y - 2\cdot x\cdot z - 2\cdot y\cdot z = 0 \Rightarrow$$

$$\Rightarrow x^2 - 2\cdot x\cdot y + y^2 + x^2 - 2\cdot x\cdot z + z^2 + y^2 - 2\cdot y\cdot z + z^2 = 0 \Rightarrow$$

$$\Rightarrow \left(x^2 - 2\cdot x\cdot y + y^2\right) + \left(x^2 - 2\cdot x\cdot z + z^2\right) + \left(y^2 - 2\cdot y\cdot z + z^2\right) = 0 \Rightarrow$$

$$\Rightarrow (x-y)^2 + (x-z)^2 + (y-z)^2 = 0 \Rightarrow \left.\begin{array}{l} x-y=0 \\ x-z=0 \\ y-z=0 \end{array}\right\} \Rightarrow x = y = z.$$

Rješenje sustava je svaka trojka realnih brojeva oblika:

$$(a,\ a,\ a)\ ,\ a \in R.$$

Vježba 125

Riješi sustav jednadžbi: $\begin{cases} x^2 + x = y\cdot z + y \\ y^2 + y = x\cdot z + z \\ z^2 + z = x\cdot y + x \end{cases}$.

Rezultat: $(a,\ a,\ a)\ ,\ a \in R.$

Zadatak 126 (Katarina, maturantica)

Zeleni čaj pakiran je u kutije od 20 g i 50 g. Kutija od 20 g košta 11.30 kn, a kutija od 50 g košta 25 kn. Veletrgovac je 5200 g čaja platio 2743 kn. Koliko je ukupno kutija čaja kupio?

A. 75 *B.* 107 *C.* 170 *D.* 354

Rješenje 126

Ponovimo!

Sve jasno!

Neka je x broj kutija od 20 g, a y broj kutija od 50 g. Kutija od 20 g košta 11.30 kn, a kutija od 50 g košta 25 kn.

Veletrgovac je:

- kupio 5200 g čaja pa vrijedi jednadžba

$$20\cdot x + 50\cdot y = 5\,200$$

- platio 2743 kn pa vrijedi jednadžba

$$11.30\cdot x + 25\cdot y = 2\,743.$$

Dobijemo sustav!

$$\left.\begin{array}{l} 20\cdot x + 50\cdot y = 5\,200 \\ 11.30\cdot x + 25\cdot y = 2\,743 \end{array}\right\} \Rightarrow \left[\begin{array}{l} \text{metoda suprotnih} \\ \text{koeficijenata} \end{array}\right] \Rightarrow \left.\begin{array}{l} 20\cdot x + 50\cdot y = 5\,200 \\ 11.30\cdot x + 25\cdot y = 2\,743 \ /\cdot(-2) \end{array}\right\} \Rightarrow$$

$$\Rightarrow \left.\begin{array}{l} 20\cdot x + 50\cdot y = 5\,200 \\ -22.60\cdot x - 50\cdot y = -5\,486 \end{array}\right\} \Rightarrow -2.6\cdot x = -286 \Rightarrow -2.6\cdot x = -286 \ /:(-2.6) \Rightarrow x = 110.$$

Računamo y.

$$\left.\begin{array}{l} x=110 \\ 20\cdot x+50\cdot y=5\,200 \end{array}\right\} \Rightarrow \left.\begin{array}{l} x=110 \\ 20\cdot x+50\cdot y=5\,200 \ /:10 \end{array}\right\} \Rightarrow \left.\begin{array}{l} x=110 \\ 2\cdot x+5\cdot y=520 \end{array}\right\} \Rightarrow$$

$$\Rightarrow 2\cdot 110+5\cdot y=520 \Rightarrow 220+5\cdot y=520 \Rightarrow 5\cdot y=520-220 \Rightarrow 5\cdot y=300 \Rightarrow$$

$$\Rightarrow 5\cdot y=300 \ /:5 \Rightarrow y=60.$$

Veletrgovac je ukupno kupio 170 kutija čaja.

$$x+y=110+60=170.$$

Odgovor je pod C.

Vježba 126

Zeleni čaj pakiran je u kutije od 2 dag i 5 dag. Kutija od 2 dag košta 11.30 kn, a kutija od 5 dag košta 25 kn. Veletrgovac je 520 dag čaja platio 2743 kn. Koliko je ukupno kutija čaja kupio?

A. 75 *B.* 107 *C.* 170 *D.* 354

Rezultat: C.

Zadatak 127 (Darko, gimnazija)

Ako je zadan sustav jednadžba $\frac{x-y\cdot\sqrt{x^2-y^2}}{\sqrt{1-x^2+y^2}}=a,\ \frac{y-x\cdot\sqrt{x^2-y^2}}{\sqrt{1-x^2+y^2}}=b,\ a,\ b\in R,$ tada je x^2-y^2 jednako:

A. $a+b$ *B.* $a-b$ *C.* a^2+b^2 *D.* a^2-b^2

Rješenje 127

Ponovimo!

$$\left(\frac{a}{b}\right)^n=\frac{a^n}{b^n} \quad , \quad (a-b)^2=a^2-2\cdot a\cdot b+b^2 \quad , \quad \left(\sqrt{a}\right)^2=a \quad , \quad (a\cdot b)^n=a^n\cdot b^n.$$

$$\frac{a}{n}-\frac{b}{n}=\frac{a-b}{n} \quad , \quad \left.\begin{array}{l} a=b \\ c=d \end{array}\right\} \Rightarrow a-c=b-d.$$

Zakon distribucije množenja prema zbrajanju.

$$a\cdot(b+c)=a\cdot b+a\cdot c \quad , \quad a\cdot b+a\cdot c=a\cdot(b+c).$$

$$\left.\begin{array}{l} \frac{x-y\cdot\sqrt{x^2-y^2}}{\sqrt{1-x^2+y^2}}=a \\ \frac{y-x\cdot\sqrt{x^2-y^2}}{\sqrt{1-x^2+y^2}}=b \end{array}\right\} \Rightarrow \left.\begin{array}{l} \frac{x-y\cdot\sqrt{x^2-y^2}}{\sqrt{1-x^2+y^2}}=a\ /^2 \\ \frac{y-x\cdot\sqrt{x^2-y^2}}{\sqrt{1-x^2+y^2}}=b\ /^2 \end{array}\right\} \Rightarrow \left.\begin{array}{l} \left(\frac{x-y\cdot\sqrt{x^2-y^2}}{\sqrt{1-x^2+y^2}}\right)^2=a^2 \\ \left(\frac{y-x\cdot\sqrt{x^2-y^2}}{\sqrt{1-x^2+y^2}}\right)^2=b^2 \end{array}\right\} \Rightarrow$$

$$\Rightarrow \left.\begin{array}{l} \dfrac{\left(x-y\cdot\sqrt{x^2-y^2}\right)^2}{\left(\sqrt{1-x^2+y^2}\right)^2}=a^2 \\ \dfrac{\left(y-x\cdot\sqrt{x^2-y^2}\right)^2}{\left(\sqrt{1-x^2+y^2}\right)^2}=b^2 \end{array}\right\} \Rightarrow \left.\begin{array}{l} \dfrac{x^2-2\cdot x\cdot y\cdot\sqrt{x^2-y^2}+\left(y\cdot\sqrt{x^2-y^2}\right)^2}{1-x^2+y^2}=a^2 \\ \dfrac{y^2-2\cdot x\cdot y\cdot\sqrt{x^2-y^2}+\left(x\cdot\sqrt{x^2-y^2}\right)^2}{1-x^2+y^2}=b^2 \end{array}\right\} \Rightarrow$$

$$\Rightarrow \left.\begin{array}{l} \dfrac{x^2-2\cdot x\cdot y\cdot\sqrt{x^2-y^2}+y^2\cdot\left(\sqrt{x^2-y^2}\right)^2}{1-x^2+y^2}=a^2 \\ \dfrac{y^2-2\cdot x\cdot y\cdot\sqrt{x^2-y^2}+x^2\cdot\left(\sqrt{x^2-y^2}\right)^2}{1-x^2+y^2}=b^2 \end{array}\right\} \Rightarrow$$

$$\Rightarrow \left.\begin{array}{l} \dfrac{x^2-2\cdot x\cdot y\cdot\sqrt{x^2-y^2}+y^2\cdot\left(x^2-y^2\right)}{1-x^2+y^2}=a^2 \\ \dfrac{y^2-2\cdot x\cdot y\cdot\sqrt{x^2-y^2}+x^2\cdot\left(x^2-y^2\right)}{1-x^2+y^2}=b^2 \end{array}\right\} \Rightarrow \left[\begin{array}{l}\text{oduzmemo}\\ \text{jednadžbe}\end{array}\right] \Rightarrow$$

$$\Rightarrow \frac{x^2-2\cdot x\cdot y\cdot\sqrt{x^2-y^2}+y^2\cdot\left(x^2-y^2\right)}{1-x^2+y^2}-\frac{y^2-2\cdot x\cdot y\cdot\sqrt{x^2-y^2}+x^2\cdot\left(x^2-y^2\right)}{1-x^2+y^2}=a^2-b^2 \Rightarrow$$

$$\Rightarrow \frac{x^2-2\cdot x\cdot y\cdot\sqrt{x^2-y^2}+y^2\cdot\left(x^2-y^2\right)-\left(y^2-2\cdot x\cdot y\cdot\sqrt{x^2-y^2}+x^2\cdot\left(x^2-y^2\right)\right)}{1-x^2+y^2}=a^2-b^2 \Rightarrow$$

$$\Rightarrow \frac{x^2-2\cdot x\cdot y\cdot\sqrt{x^2-y^2}+y^2\cdot\left(x^2-y^2\right)-y^2+2\cdot x\cdot y\cdot\sqrt{x^2-y^2}-x^2\cdot\left(x^2-y^2\right)}{1-x^2+y^2}=a^2-b^2 \Rightarrow$$

$$\Rightarrow \frac{x^2-2\cdot x\cdot y\cdot\sqrt{x^2-y^2}+y^2\cdot\left(x^2-y^2\right)-y^2+2\cdot x\cdot y\cdot\sqrt{x^2-y^2}-x^2\cdot\left(x^2-y^2\right)}{1-x^2+y^2}=a^2-b^2 \Rightarrow$$

$$\Rightarrow \frac{x^2+y^2\cdot\left(x^2-y^2\right)-y^2-x^2\cdot\left(x^2-y^2\right)}{1-x^2+y^2}=a^2-b^2 \Rightarrow$$

$$\Rightarrow \frac{x^2-y^2-x^2\cdot\left(x^2-y^2\right)+y^2\cdot\left(x^2-y^2\right)}{1-x^2+y^2}=a^2-b^2 \Rightarrow$$

$$\Rightarrow \frac{\left(x^2-y^2\right)-x^2\cdot\left(x^2-y^2\right)+y^2\cdot\left(x^2-y^2\right)}{1-x^2+y^2}=a^2-b^2 \Rightarrow$$

$$\Rightarrow \frac{\left(x^2-y^2\right)\cdot\left(1-x^2+y^2\right)}{1-x^2+y^2}=a^2-b^2 \Rightarrow \frac{\left(x^2-y^2\right)\cdot\left(1-x^2+y^2\right)}{1-x^2+y^2}=a^2-b^2 \Rightarrow x^2-y^2=a^2-b^2.$$

Odgovor je pod D.

Vježba 127

Odmor!

Rezultat: …

Zadatak 128 (Vesna, ekonomska škola)

Razred od 26 učenika bio je na izletu. Cijena toga izleta po učeniku iznosila je 2100 kn za plaćanje na rate, 1995 kn za jednokratno plaćanje. Razred je izlet ukupno platio 52185 kn. Koliko je učenika toga razreda izlet platilo jednokratno?

Rješenje 128

Ponovimo!

Zakon distribucije množenja prema zbrajanju.

$$a\cdot(b+c)=a\cdot b+a\cdot c \quad , \quad a\cdot b+a\cdot c=a\cdot(b+c).$$

1.inačica

Neka je:

- x broj učenika koji plaćaju na rate
- y broj učenika koji plaćaju jednokratno.

U razredu je 26 učenika pa vrijedi jednadžba:

$$x+y=26.$$

Izlet je ukupno plaćen 52185 kn pri čemu je cijena za plaćanje na rate 2100 kn, a za jednokratno plaćanje 1995 kn po učeniku. Zato je valjana jednadžba:

$$2100\cdot x+1995\cdot y=52185.$$

Iz sustava jednadžbi izračunamo y.

$$\left.\begin{array}{l} x+y=26 \\ 2100\cdot x+1995\cdot y=52185 \end{array}\right\} \Rightarrow \left[\begin{array}{l} \text{metoda zamjene,} \\ \text{supstitucije} \end{array}\right] \Rightarrow \left.\begin{array}{l} x=26-y \\ 2100\cdot x+1995\cdot y=52185 \end{array}\right\} \Rightarrow$$

$$\Rightarrow 2100\cdot(26-y)+1995\cdot y=52185 \Rightarrow 54600-2100\cdot y+1995\cdot y=52185 \Rightarrow$$

$$\Rightarrow -2100\cdot y+1995\cdot y=52185-54600 \Rightarrow -105\cdot y=-2415 \Rightarrow$$

$$\Rightarrow -105\cdot y=-2415 \ /:(-105) \Rightarrow y=23.$$

2.inačica

U razredu je 26 učenika. Neka je x broj učenika koji plaćaju jednokratno. Tada je 26 – x broj učenika koji plaćaju na rate.

Izlet je ukupno plaćen 52185 kn pri čemu je cijena za plaćanje na rate 2100 kn, a za jednokratno plaćanje 1995 kn po učeniku. Vrijedi jednadžba:

$$2100\cdot(26-x)+1995\cdot x=52185 \Rightarrow 54600-2100\cdot x+1995\cdot x=52185 \Rightarrow$$

$$\Rightarrow -2100\cdot x+1995\cdot x=52185-54600 \Rightarrow -105\cdot x=-2415 \Rightarrow$$

$$\Rightarrow -105\cdot x=-2415 \ /:(-105) \Rightarrow x=23.$$

Vježba 128

Razred od 26 učenika bio je na izletu. Cijena toga izleta po učeniku iznosila je 2100 kn za plaćanje na rate, 1995 kn za jednokratno plaćanje. Razred je izlet ukupno platio 52185 kn. Koliko je učenika toga razreda izlet platilo na rate?

Rezultat: 3.