Zadatak 741 (Marija, srednja škola)

Napiši u obliku umnoška: $2\cdot a\cdot(a-1)^2+8\cdot a\cdot(a-1)+8\cdot a.$

Rješenje 741

Ponovimo!

$$a^2+2\cdot a\cdot b+b^2=(a+b)^2.$$

Zakon distribucije množenja prema zbrajanju.

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

$$2\cdot a\cdot(a-1)^2+8\cdot a\cdot(a-1)+8\cdot a=\left[\text{ izlučimo } 2\cdot a\right]=$$

$$=2\cdot a\cdot\left((a-1)^2+4\cdot(a-1)+4\right)=2\cdot a\cdot\left((a-1)^2+2\cdot 2\cdot(a-1)+2^2\right)=$$

$$=2\cdot a\cdot\left((a-1)+2\right)^2=2\cdot a\cdot(a-1+2)^2=2\cdot a\cdot(a+1)^2.$$

Vježba 741

Napiši u obliku umnoška: $2\cdot(a-1)^2+8\cdot(a-1)+8.$

Rezultat: $2\cdot(a+1)^2.$

Zadatak 742 (Marija, srednja škola)

Napiši u obliku umnoška: $81\cdot x^4-1.$

Rješenje 742

Ponovimo!

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

$$81\cdot x^4-1=\left(9\cdot x^2\right)^2-1^2=\left(9\cdot x^2-1\right)\cdot\left(9\cdot x^2+1\right)=\left((3\cdot x)^2-1^2\right)\cdot\left(9\cdot x^2+1\right)=$$

$$=(3\cdot x-1)\cdot(3\cdot x+1)\cdot\left(9\cdot x^2+1\right).$$

Vježba 742

Napiši u obliku umnoška: $16\cdot x^4-1.$

Rezultat: $(2\cdot x-1)\cdot(2\cdot x+1)\cdot\left(4\cdot x^2+1\right).$

Zadatak 743 (Marija, srednja škola)

Napiši u obliku umnoška: $a\cdot(a+b-1)+b\cdot(a+b-1)-a-b+1.$

Rješenje 743

Ponovimo!

$$a^1=a \quad , \quad a^n\cdot a^m=a^{n+m}.$$

Zakon distribucije množenja prema zbrajanju.

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

$$a\cdot(a+b-1)+b\cdot(a+b-1)-a-b+1=a\cdot(a+b-1)+b\cdot(a+b-1)+(-a-b+1)=$$

$$=a\cdot(a+b-1)+b\cdot(a+b-1)-(a+b-1)=\left[\text{ izlučimo } a+b-1\right]=$$

$$=(a+b-1)\cdot(a+b-1)=(a+b-1)^2.$$

Vježba 743

Napiši u obliku umnoška: $a\cdot(a+b+1)+b\cdot(a+b+1)+a+b+1.$

Rezultat: $(a+b+1)^2.$

Zadatak 744 (Marija, srednja škola)

Napiši u obliku umnoška: $x^3-3\cdot x^2-3\cdot x+9.$

Rješenje 744

Ponovimo!

$$a^1=a \quad , \quad a^n:a^m=a^{n-m}.$$

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

$$x^3-3\cdot x^2-3\cdot x+9=\left(x^3-3\cdot x^2\right)+(-3\cdot x+9)=$$

$$=\left[\begin{array}{l}\text{iz prve zagrade izlučimo } x^2\\ \text{iz druge zagrade izlučimo } -3\end{array}\right]=x^2\cdot(x-3)-3\cdot(x-3)=$$

$$=\left[\text{ izlučimo } x-3\right]=(x-3)\cdot\left(x^2-3\right).$$

2.inačica

$$x^3-3\cdot x^2-3\cdot x+9=x^3-3\cdot x-3\cdot x^2+9=\left(x^3-3\cdot x\right)+\left(-3\cdot x^2+9\right)=$$

$$=\left[\begin{array}{l}\text{iz prve zagrade izlučimo } x\\ \text{iz druge zagrade izlučimo } -3\end{array}\right]=x\cdot\left(x^2-3\right)-3\cdot\left(x^2-3\right)=$$

$$=\left[\text{ izlučimo } x^2-3\right]=\left(x^2-3\right)\cdot(x-3).$$

Vježba 744

Napiši u obliku umnoška: $x^3+3\cdot x^2+3\cdot x+9.$

Rezultat: $\left(x^2+3\right)\cdot(x+3).$

Zadatak 745 (Marija, srednja škola)

Napiši u obliku umnoška: $(x-y)\cdot(x-y+1)^2-2\cdot(x-y)\cdot(x-y+1)+x-y.$

Rješenje 745

Ponovimo!

$$a^2-2\cdot a\cdot b+b^2=(a-b)^2 \quad , \quad a^1=a \quad , \quad a^n\cdot a^m=a^{n+m}.$$

Zakon distribucije množenja prema zbrajanju.

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

$$(x-y)\cdot(x-y+1)^2-2\cdot(x-y)\cdot(x-y+1)+x-y=$$

$$=(x-y)\cdot(x-y+1)^2-2\cdot(x-y)\cdot(x-y+1)+(x-y)=$$

$$=\left[\text{ izlučimo } x-y\right]=(x-y)\cdot\left((x-y+1)^2-2\cdot(x-y+1)+1\right)=$$

$$=(x-y)\cdot((x-y+1)-1)^2=(x-y)\cdot(x-y+1-1)^2=(x-y)\cdot(x-y+1-1)^2=$$

$$=(x-y)\cdot(x-y)^2=(x-y)^1\cdot(x-y)^2=(x-y)^3.$$

Vježba 745

Napiši u obliku umnoška: $(x-y)\cdot(x-y+1)^2+2\cdot(y-x)\cdot(x-y+1)+x-y.$

Rezultat: $(x-y)^3.$

Zadatak 746 (Domagoj, srednja škola)

Rastavi na faktore: $\left(a^2-b^2\right)^2-(a-b)^4.$

Rješenje 746

Ponovimo!

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

Zakon distribucije množenja prema zbrajanju.

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

$$\left(a^2-b^2\right)^2-(a-b)^4=((a-b)\cdot(a+b))^2-(a-b)^4=(a-b)^2\cdot(a+b)^2-(a-b)^4=$$

$$=\left[\text{ izlučimo } (a-b)^2\right]=(a-b)^2\cdot\left((a+b)^2-(a-b)^2\right)=$$

$$=(a-b)^2\cdot((a+b)-(a-b))\cdot((a+b)+(a-b))=$$

$$=(a-b)^2\cdot(a+b-a+b)\cdot(a+b+a-b)=(a-b)^2\cdot(a+b-a+b)\cdot(a+b+a-b)=$$

$$=(a-b)^2\cdot 2\cdot b\cdot 2\cdot a=4\cdot a\cdot b\cdot(a-b)^2.$$

Vježba 746

Rastavi na faktore: $\left(b^2-a^2\right)^2-(b-a)^4.$

Rezultat: $4\cdot a\cdot b\cdot(b-a)^2=4\cdot a\cdot b\cdot(a-b)^2.$

Zadatak 747 (Domagoj, srednja škola)

Rastavi na faktore: $x^{12}+1.$

Rješenje 747

Ponovimo!

$$\left(a^n\right)^m=a^{n\cdot m} \quad , \quad a^3+b^3=(a+b)\cdot\left(a^2-a\cdot b+b^2\right).$$

$$x^{12}+1=\left(x^4\right)^3+1^3=\left(x^4+1\right)\cdot\left(\left(x^4\right)^2-x^4\cdot 1+1^2\right)=\left(x^4+1\right)\cdot\left(x^8-x^4+1\right).$$

Vježba 747

Rastavi na faktore: $1+x^{12}$.

Rezultat: $\left(x^4+1\right)\cdot\left(x^8-x^4+1\right)$.

Zadatak 748 (Domagoj, srednja škola)

Rastavi na faktore: $x^{12}-1$.

Rješenje 748

Ponovimo!

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

$$a^3-b^3=(a-b)\cdot\left(a^2+a\cdot b+b^2\right)\quad,\quad a^3+b^3=(a+b)\cdot\left(a^2-a\cdot b+b^2\right).$$

1.inačica

$$x^{12}-1=\left(x^6\right)^2-1^2=\left(x^6-1\right)\cdot\left(x^6+1\right)=\left(\left(x^3\right)^2-1^2\right)\cdot\left(\left(x^2\right)^3+1^3\right)=$$

$$=\left(x^3-1\right)\cdot\left(x^3+1\right)\left(x^2+1\right)\cdot\left(\left(x^2\right)^2-x^2\cdot1+1^2\right)=$$

$$=\left(x^3-1\right)\cdot\left(x^3+1\right)\cdot\left(x^2+1\right)\cdot\left(x^4-x^2+1\right)=$$

$$=(x-1)\cdot\left(x^2+x+1\right)\cdot(x+1)\cdot\left(x^2-x+1\right)\cdot\left(x^2+1\right)\cdot\left(x^4-x^2+1\right)=$$

$$=(x-1)\cdot(x+1)\cdot\left(x^2+1\right)\cdot\left(x^2-x+1\right)\cdot\left(x^2+x+1\right)\cdot\left(x^4-x^2+1\right).$$

2.inačica

$$x^{12}-1=\left(x^4\right)^3-1^3=\left(x^4-1\right)\cdot\left(\left(x^4\right)^2+x^4\cdot1+1^2\right)=\left(x^4-1\right)\cdot\left(x^8+x^4+1\right)=$$

$$=\left(\left(x^2\right)^2-1^2\right)\cdot\left(x^8+2\cdot x^4-x^4+1\right)=\left(x^2-1\right)\cdot\left(x^2+1\right)\cdot\left(x^8+2\cdot x^4+1-x^4\right)=$$

$$=(x-1)\cdot(x+1)\cdot\left(x^2+1\right)\cdot\left(\left(x^8+2\cdot x^4+1\right)-x^4\right)=$$

$$=(x-1)\cdot(x+1)\cdot\left(x^2+1\right)\cdot\left(\left(\left(x^4\right)^2+2\cdot x^4\cdot1+1^2\right)-x^4\right)=$$

$$=(x-1)\cdot(x+1)\cdot\left(x^2+1\right)\cdot\left(\left(x^4+1\right)^2-\left(x^2\right)^2\right)=$$

$$=(x-1)\cdot(x+1)\cdot\left(x^2+1\right)\cdot\left(x^4+1-x^2\right)\cdot\left(x^4+1+x^2\right)=$$

$$=(x-1)\cdot(x+1)\cdot\left(x^2+1\right)\cdot\left(x^4-x^2+1\right)\cdot\left(x^4+x^2+1\right)=$$

$$=(x-1)\cdot(x+1)\cdot\left(x^2+1\right)\cdot\left(x^4-x^2+1\right)\cdot\left(x^4+2\cdot x^2-x^2+1\right)=$$

$$=(x-1)\cdot(x+1)\cdot\left(x^2+1\right)\cdot\left(x^4-x^2+1\right)\cdot\left(x^4+2\cdot x^2+1-x^2\right)=$$

$$=(x-1)\cdot(x+1)\cdot\left(x^2+1\right)\cdot\left(x^4-x^2+1\right)\cdot\left(\left(x^4+2\cdot x^2+1\right)-x^2\right)=$$

$$=(x-1)\cdot(x+1)\cdot\left(x^2+1\right)\cdot\left(x^4-x^2+1\right)\cdot\left(\left(\left(x^2\right)^2+2\cdot x^2\cdot 1+1^2\right)-x^2\right)=$$

$$=(x-1)\cdot(x+1)\cdot\left(x^2+1\right)\cdot\left(x^4-x^2+1\right)\cdot\left(\left(x^2+1\right)^2-x^2\right)=$$

$$=(x-1)\cdot(x+1)\cdot\left(x^2+1\right)\cdot\left(x^4-x^2+1\right)\cdot\left(x^2+1-x\right)\cdot\left(x^2+1+x\right)=$$

$$=(x-1)\cdot(x+1)\cdot\left(x^2+1\right)\cdot\left(x^4-x^2+1\right)\cdot\left(x^2-x+1\right)\cdot\left(x^2+x+1\right)=$$

$$=(x-1)\cdot(x+1)\cdot\left(x^2+1\right)\cdot\left(x^2-x+1\right)\cdot\left(x^2+x+1\right)\cdot\left(x^4-x^2+1\right).$$

Vježba 748

Rastavi na faktore: $a^{12}-1.$

Rezultat: $(a-1)\cdot(a+1)\cdot\left(a^2+1\right)\cdot\left(a^2-a+1\right)\cdot\left(a^2+a+1\right)\cdot\left(a^4-a^2+1\right).$

Zadatak 749 (Domagoj, srednja škola)

Dokaži da je $a^4-a^2-3\cdot a+5>0,$ za svaki $a\geq 0.$

Rješenje 749

Ponovimo!

$$\left(a^n\right)^m=a^{n\cdot m}\quad,\quad (a-b)^2=a^2-2\cdot a\cdot b+b^2\quad,\quad a^2\geq 0\ ,\ a\in R.$$

$$a^2-2\cdot a\cdot b+b^2=(a-b)^2\quad,\quad n=\frac{n}{1}\quad,\quad \frac{a}{b}+\frac{c}{d}=\frac{a\cdot d+b\cdot c}{b\cdot d}\quad,\quad \left.\begin{matrix}a\geq 0\\ b\geq 0\end{matrix}\right\}\Rightarrow a+b\geq 0.$$

Pokažimo da su istinite sljedeće nejednakosti:

- $a^4-2\cdot a^2+1\geq 0$

Dokaz

$$a^4-2\cdot a^2+1=\left(a^2\right)^2-2\cdot a^2\cdot 1+1^2=\left(a^2-1\right)^2\geq 0$$

- $a^2-3\cdot a+4>0$

Dokaz

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

$$=\left(a-\frac{3}{2}\right)^2+\frac{-9+16}{4}=\left(a-\frac{3}{2}\right)^2+\frac{7}{4}>0.$$

Zbrojimo li dvije točne nejednakosti dobit ćemo traženu tvrdnju.

$$\left.\begin{array}{l} a^4-2\cdot a^2+1\geq 0 \\ a^2-3\cdot a+4>0 \end{array}\right\} \Rightarrow \left[\begin{array}{l}\text{zbrojimo}\\ \text{nejednakosti}\end{array}\right] \Rightarrow$$

$$\Rightarrow a^4-2\cdot a^2+1+a^2-3\cdot a+4>0 \Rightarrow a^4-a^2-3\cdot a+5>0.$$

Vježba 749

Dokaži da je $a^4-a^2+5>3\cdot a,$ za svaki $a\geq 0.$

Rezultat: Dokaz analogan.

Zadatak 750 (Nives, srednja škola)

Ako za brojeve a, b i c vrijedi jednakost

$$\frac{1}{a}+\frac{1}{b}+\frac{1}{c}=\frac{1}{a+b+c},\ a\neq 0,\ b\neq 0,\ c\neq 0,\ a+b+c\neq 0,$$

onda je zbroj bilo koja dva od njih jednak nuli. Dokažite.

Rješenje 750

Ponovimo!

$$a^1=a \quad , \quad a^n\cdot a^m=a^{n+m}.$$

Zakon distribucije množenja prema zbrajanju.

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

Da bi umnožak bio jednak nuli, dovoljno je da jedan faktor bude jednak nuli.

$$a\cdot b=0 \Leftrightarrow a=0 \text{ ili } b=0 \text{ ili } a=b=0.$$

Preoblikujemo zadanu jednakost.

$$\frac{1}{a}+\frac{1}{b}+\frac{1}{c}=\frac{1}{a+b+c} \Rightarrow \frac{1}{a}+\frac{1}{b}+\frac{1}{c}-\frac{1}{a+b+c}=0 \Rightarrow$$

$$\Rightarrow \frac{1}{a}+\frac{1}{b}+\frac{1}{c}-\frac{1}{a+b+c}=0 \ /\cdot\ a\cdot b\cdot c\cdot(a+b+c) \Rightarrow$$

$$\Rightarrow b\cdot c\cdot(a+b+c)+a\cdot c\cdot(a+b+c)+a\cdot b\cdot(a+b+c)-a\cdot b\cdot c=0 \Rightarrow$$

$$\Rightarrow b\cdot c\cdot(a+(b+c))+a\cdot c\cdot(a+(b+c))+a\cdot b\cdot(a+(b+c))-a\cdot b\cdot c=0 \Rightarrow$$

$$\Rightarrow a\cdot b\cdot c+b\cdot c\cdot(b+c)+a^2\cdot c+a\cdot c\cdot(b+c)+a^2\cdot b+a\cdot b\cdot(b+c)-a\cdot b\cdot c=0 \Rightarrow$$

$$\Rightarrow a\cdot b\cdot c+b\cdot c\cdot(b+c)+a^2\cdot c+a\cdot c\cdot(b+c)+a^2\cdot b+a\cdot b\cdot(b+c)-a\cdot b\cdot c=0 \Rightarrow$$

$$\Rightarrow b\cdot c\cdot(b+c)+a^2\cdot c+a\cdot c\cdot(b+c)+a^2\cdot b+a\cdot b\cdot(b+c)=0 \Rightarrow$$

$$\Rightarrow b\cdot c\cdot(b+c)+a\cdot c\cdot(b+c)+a\cdot b\cdot(b+c)+a^2\cdot b+a^2\cdot c=0 \Rightarrow$$

$$\Rightarrow b\cdot c\cdot(b+c)+a\cdot c\cdot(b+c)+a\cdot b\cdot(b+c)+a^2\cdot(b+c)=0 \Rightarrow [\text{izlučimo } b+c] \Rightarrow$$

$$\Rightarrow (b+c)\cdot\left(b\cdot c+a\cdot c+a\cdot b+a^2\right)=0 \Rightarrow (b+c)\cdot\left((b\cdot c+a\cdot c)+\left(a\cdot b+a^2\right)\right)=0 \Rightarrow$$

$$\Rightarrow (b+c)\cdot(c\cdot(b+a)+a\cdot(b+a))=0 \Rightarrow [\text{izlučimo } b+a] \Rightarrow (b+c)\cdot(b+a)\cdot(c+a)=0 \Rightarrow$$

$$\Rightarrow\ (a+b)\cdot(a+c)\cdot(b+c)=0\ \Rightarrow\ \left.\begin{array}{r} a+b=0 \\ a+c=0 \\ b+c=0 \end{array}\right\}.$$

Zadana jednakost ekvivalentna je sustavu.

Vježba 750

Ako za brojeve a, b i c vrijedi jednakost

$$\frac{1}{a}+\frac{1}{b}=\frac{1}{a+b+c}-\frac{1}{c},\ a\neq 0,\ b\neq 0,\ c\neq 0,\ a+b+c\neq 0,$$

onda je zbroj bilo koja dva od njih jednak nuli. Dokažite.

Rezultat: Dokaz analogan.

Zadatak 751 (Mimi, gimnazija)

Pojednostavnite: $\dfrac{\dfrac{2\cdot a-b}{b}+1}{\dfrac{2\cdot a+b}{b}-1}.$

Rješenje 751

Ponovimo!

$$n=\frac{n}{1}\quad,\quad \frac{a}{b}+\frac{c}{d}=\frac{a\cdot d+b\cdot c}{b\cdot d}\quad,\quad \frac{a}{b}-\frac{c}{d}=\frac{a\cdot d-b\cdot c}{b\cdot d}.$$

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

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

$$\frac{\dfrac{2\cdot a-b}{b}+1}{\dfrac{2\cdot a+b}{b}-1}=\frac{\dfrac{2\cdot a-b}{b}+\dfrac{1}{1}}{\dfrac{2\cdot a+b}{b}-\dfrac{1}{1}}=\frac{\dfrac{2\cdot a-b+b}{b}}{\dfrac{2\cdot a+b-b}{b}}=\frac{\dfrac{2\cdot a-b+b}{b}}{\dfrac{2\cdot a+b-b}{b}}=\frac{\dfrac{2\cdot a}{b}}{\dfrac{2\cdot a}{b}}=\frac{\dfrac{2\cdot a}{b}}{\dfrac{2\cdot a}{b}}=1.$$

Vježba 751

Pojednostavnite: $\dfrac{\dfrac{2\cdot a+b}{b}-1}{\dfrac{2\cdot a-b}{b}+1}.$

Rezultat: 1.

Zadatak 752 (Mimi, gimnazija)

Pojednostavnite: $\dfrac{\dfrac{a-b}{a+b}+1}{\dfrac{a+b}{a-b}-1}\cdot\dfrac{a+b}{a-b}.$

Rješenje 752

Ponovimo!

$$n=\frac{n}{1}\quad,\quad \frac{a}{b}+\frac{c}{d}=\frac{a\cdot d+b\cdot c}{b\cdot d}\quad,\quad \frac{a}{b}-\frac{c}{d}=\frac{a\cdot d-b\cdot c}{b\cdot d}.$$

$$\frac{\frac{a}{b}}{\frac{c}{d}}=\frac{a\cdot d}{b\cdot c}.$$

Zakon distribucije množenja prema zbrajanju.

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

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

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

$$\frac{\frac{a-b}{a+b}+1}{\frac{a+b}{a-b}-1}\cdot\frac{a+b}{a-b}=\frac{\frac{a-b}{a+b}+\frac{1}{1}}{\frac{a+b}{a-b}-\frac{1}{1}}\cdot\frac{a+b}{a-b}=\frac{\frac{a-b+a+b}{a+b}}{\frac{a+b-(a-b)}{a-b}}\cdot\frac{a+b}{a-b}=\frac{\frac{a-b+a+b}{a+b}}{\frac{a+b-a+b}{a-b}}\cdot\frac{a+b}{a-b}=$$

$$=\frac{\frac{a-b+a+b}{a+b}}{\frac{a+b-a+b}{a-b}}\cdot\frac{a+b}{a-b}=\frac{\frac{2\cdot a}{a+b}}{\frac{2\cdot b}{a-b}}\cdot\frac{a+b}{a-b}=\frac{2\cdot a\cdot(a-b)}{2\cdot b\cdot(a+b)}\cdot\frac{a+b}{a-b}=\frac{2\cdot a\cdot(a-b)}{2\cdot b\cdot(a+b)}\cdot\frac{a+b}{a-b}=\frac{a}{b}.$$

Vježba 752

Pojednostavnite: $\frac{\frac{a+b}{a-b}-1}{\frac{a-b}{a+b}+1}\cdot\frac{a-b}{a+b}.$

Rezultat: $\frac{b}{a}.$

Zadatak 753 (Višnja, srednja škola)

Izračunaj: $\left(\sqrt{a}+\sqrt{b}\right)^{-2}\cdot\left(a^{-1}+b^{-1}\right)+\frac{2}{\left(\sqrt{a}+\sqrt{b}\right)^{3}}\cdot\left(\frac{1}{\sqrt{a}}+\frac{1}{\sqrt{b}}\right).$

Rješenje 753

Ponovimo!

$$a^{-n}=\frac{1}{a^{n}} \quad , \quad a^{1}=a \quad , \quad \frac{a}{b}+\frac{c}{d}=\frac{a\cdot d+b\cdot c}{b\cdot d} \quad , \quad \sqrt{a}\cdot\sqrt{b}=\sqrt{a\cdot b} \quad , \quad \frac{a}{b}\cdot\frac{c}{d}=\frac{a\cdot c}{b\cdot d}.$$

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

Zakon distribucije množenja prema zbrajanju.

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

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

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

1.inačica

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

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

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

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

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

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

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

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

2.inačica

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

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

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

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

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

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

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

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

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

Vježba 753

Izračunaj: $\frac{2}{\left(\sqrt{a}+\sqrt{b}\right)^3}\cdot\left(\frac{1}{\sqrt{a}}+\frac{1}{\sqrt{b}}\right)+\left(\sqrt{a}+\sqrt{b}\right)^{-2}\cdot\left(a^{-1}+b^{-1}\right).$

Rezultat: $\frac{1}{a\cdot b}.$

Zadatak 754 (Tomislav, srednja škola)

Pojednostavnite izraz: $\left(\sqrt{a\cdot b}+\sqrt{c}\right)^2+\left(\sqrt{a\cdot c}-\sqrt{b}\right)^2.$

Rješenje 754

Ponovimo!

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

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

Zakon distribucije množenja prema zbrajanju.

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

$$\left(\sqrt{a\cdot b}+\sqrt{c}\right)^2+\left(\sqrt{a\cdot c}-\sqrt{b}\right)^2=$$

$$=\left(\sqrt{a\cdot b}\right)^2+2\cdot\sqrt{a\cdot b}\cdot\sqrt{c}+\left(\sqrt{c}\right)^2+\left(\sqrt{a\cdot c}\right)^2-2\cdot\sqrt{a\cdot c}\cdot\sqrt{b}+\left(\sqrt{b}\right)^2=$$

$$=a\cdot b+2\cdot\sqrt{a\cdot b\cdot c}+c+a\cdot c-2\cdot\sqrt{a\cdot b\cdot c}+b=a\cdot b+2\cdot\sqrt{a\cdot b\cdot c}+c+a\cdot c-2\cdot\sqrt{a\cdot b\cdot c}+b=$$

$$=a\cdot b+c+a\cdot c+b=\left[\begin{array}{c}\text{metoda}\\ \text{grupiranja}\end{array}\right]=(a\cdot b+b)+(a\cdot c+c)=b\cdot(a+1)+c\cdot(a+1)=(a+1)\cdot(b+c).$$

Vježba 754

Pojednostavnite izraz: $\left(\sqrt{a\cdot b}+\sqrt{c}\right)^2+\left(\sqrt{b}-\sqrt{a\cdot c}\right)^2.$

Rezultat: $(a+1)\cdot(b+c).$

Zadatak 755 (Ivan, srednja škola)

Rastavi na faktore: $9 \cdot a^2 - 12 \cdot a \cdot b + 4 \cdot b^2 - 25.$

Rješenje 755

Ponovimo!

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

Najprije združimo prva tri pribrojnika.

$$9 \cdot a^2 - 12 \cdot a \cdot b + 4 \cdot b^2 - 25 = \left(9 \cdot a^2 - 12 \cdot a \cdot b + 4 \cdot b^2\right) - 25 =$$

$$= \left((3 \cdot a)^2 - 2 \cdot 3 \cdot a \cdot 2 \cdot b + (2 \cdot b)^2\right) - 25 = (3 \cdot a - 2 \cdot b)^2 - 5^2 = (3 \cdot a - 2 \cdot b - 5) \cdot (3 \cdot a - 2 \cdot b + 5).$$

Vježba 755

Rastavi na faktore: $4 \cdot b^2 - 12 \cdot a \cdot b + 9 \cdot a^2 - 25.$

Rezultat: $(3 \cdot a - 2 \cdot b - 5) \cdot (3 \cdot a - 2 \cdot b + 5).$

Zadatak 756 (Ivan, srednja škola)

Rastavi na faktore: $a^2 \cdot b^2 - a^2 - b^2 - 4 \cdot a \cdot b + 1.$

Rješenje 756

Ponovimo!

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

$$(a+b)^2 = a^2 + 2 \cdot a \cdot b + b^2.$$

Zakon distribucije množenja prema zbrajanju.

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

$$a^2 \cdot b^2 - a^2 - b^2 - 4 \cdot a \cdot b + 1 = a^2 \cdot b^2 - 2 \cdot a \cdot b + 1 - a^2 - 2 \cdot a \cdot b - b^2 =$$

$$= \left[\begin{array}{l} \text{metoda} \\ \text{grupiranja} \end{array}\right] = \left(a^2 \cdot b^2 - 2 \cdot a \cdot b + 1\right) + \left(-a^2 - 2 \cdot a \cdot b - b^2\right) =$$

$$= \left((a \cdot b)^2 - 2 \cdot a \cdot b + 1\right) - \left(a^2 + 2 \cdot a \cdot b + b^2\right) = (a \cdot b - 1)^2 - (a+b)^2 =$$

$$= \left((a \cdot b - 1) - (a+b)\right) \cdot \left((a \cdot b - 1) + (a+b)\right) = (a \cdot b - 1 - a - b) \cdot (a \cdot b - 1 + a + b) =$$

$$= (a \cdot b - a - b - 1) \cdot (a \cdot b + a + b - 1).$$

Vježba 756

Rastavi na faktore: $a^2 \cdot b^2 - a^2 - b^2 - 6 \cdot a \cdot b + 4.$

Rezultat: $(a \cdot b - a - b - 2) \cdot (a \cdot b + a + b - 2).$

Zadatak 757 (Ivan, srednja škola)

Rastavi na faktore: $\left(x^2 - 2 \cdot x\right)^2 + 2 \cdot x^2 - 4 \cdot x + 1.$

Rješenje 757

Ponovimo!

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

$$a^1 = a \quad , \quad a^n\cdot a^m = a^{n+m} \quad , \quad (a-b)^4 = a^4 - 4\cdot a^3\cdot b + 6\cdot a^2\cdot b^2 - 4\cdot a\cdot b^3 + b^4.$$

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

$$\left(x^2-2\cdot x\right)^2 + 2\cdot x^2 - 4\cdot x + 1 = \left(x^2-2\cdot x\right)^2 + 2\cdot\left(x^2-2\cdot x\right) + 1 =$$

$$= \left(\left(x^2-2\cdot x\right)+1\right)^2 = \left(x^2-2\cdot x+1\right)^2 = \left((x-1)^2\right)^2 = (x-1)^4.$$

2.inačica

$$\left(x^2-2\cdot x\right)^2 + 2\cdot x^2 - 4\cdot x + 1 = \left(x^2\right)^2 - 2\cdot x^2\cdot 2\cdot x + (2\cdot x)^2 + 2\cdot x^2 - 4\cdot x + 1 =$$

$$= x^4 - 4\cdot x^3 + 4\cdot x^2 + 2\cdot x^2 - 4\cdot x + 1 = x^4 - 4\cdot x^3 + 6\cdot x^2 - 4\cdot x + 1 = (x-1)^4.$$

Vježba 757

Rastavi na faktore: $(x-1)^2 + 4\cdot x.$

Rezultat: $(x+1)^2.$

Zadatak 758 (Tonka, srednja škola)

Rastavi na faktore dvočlani izraz: $81\cdot x^4 - 1.$

Rješenje 758

Ponovimo!

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

$$81\cdot x^4 - 1 = \left(9\cdot x^2\right)^2 - 1^2 = \left(9\cdot x^2 - 1\right)\cdot\left(9\cdot x^2+1\right) =$$

$$= \left((3\cdot x)^2 - 1^2\right)\cdot\left(9\cdot x^2+1\right) = (3\cdot x-1)\cdot(3\cdot x+1)\cdot\left(9\cdot x^2+1\right).$$

Vježba 758

Rastavi na faktore dvočlani izraz: $1 - 81\cdot x^4.$

Rezultat: $(1-3\cdot x)\cdot(1+3\cdot x)\cdot\left(1+9\cdot x^2\right).$

Zadatak 759 (Tonka, srednja škola)

Rastavi na faktore dvočlani izraz: $64\cdot x^6 - 1.$

Rješenje 759

Ponovimo!

$$\left(a^n\right)^m = a^{n\cdot m} \quad , \quad (a\cdot b)^n = a^n\cdot b^n \quad , \quad a^3 - b^3 = (a-b)\cdot\left(a^2 + a\cdot b + b^2\right).$$

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

$$a^3+b^3=(a+b)\cdot\left(a^2-a\cdot b+b^2\right).$$

Zakon distribucije množenja prema zbrajanju.

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

1.inačica

$$64\cdot x^6-1=\left(8\cdot x^3\right)^2-1^2=\left(8\cdot x^3-1\right)\cdot\left(8\cdot x^3+1\right)=\left((2\cdot x)^3-1^3\right)\cdot\left((2\cdot x)^3+1^3\right)=$$
$$=(2\cdot x-1)\cdot\left((2\cdot x)^2+2\cdot x\cdot 1+1^2\right)\cdot(2\cdot x+1)\cdot\left((2\cdot x)^2-2\cdot x\cdot 1+1^2\right)=$$
$$=(2\cdot x-1)\cdot\left(4\cdot x^2+2\cdot x+1\right)\cdot(2\cdot x+1)\cdot\left(4\cdot x^2-2\cdot x+1\right)=$$
$$=(2\cdot x-1)\cdot(2\cdot x+1)\cdot\left(4\cdot x^2+2\cdot x+1\right)\cdot\left(4\cdot x^2-2\cdot x+1\right).$$

2.inačica

$$64\cdot x^6-1=\left(4\cdot x^2\right)^3-1^3=\left(4\cdot x^2-1\right)\cdot\left(\left(4\cdot x^2\right)^2+4\cdot x^2\cdot 1+1^2\right)=$$
$$=\left(4\cdot x^2-1\right)\cdot\left(16\cdot x^4+4\cdot x^2+1\right)=\left((2\cdot x)^2-1^2\right)\cdot\left(16\cdot x^4+8\cdot x^2+1-4\cdot x^2\right)=$$
$$=(2\cdot x-1)\cdot(2\cdot x+1)\cdot\left(\left(16\cdot x^4+8\cdot x^2+1\right)-4\cdot x^2\right)=$$
$$=(2\cdot x-1)\cdot(2\cdot x+1)\cdot\left(\left(\left(4\cdot x^2\right)^2+2\cdot 4\cdot x^2\cdot 1+1^2\right)-(2\cdot x)^2\right)=$$
$$=(2\cdot x-1)\cdot(2\cdot x+1)\cdot\left(\left(4\cdot x^2+1\right)^2-(2\cdot x)^2\right)=$$
$$=(2\cdot x-1)\cdot(2\cdot x+1)\cdot\left(4\cdot x^2+1-2\cdot x\right)\cdot\left(4\cdot x^2+1+2\cdot x\right)=$$
$$=(2\cdot x-1)\cdot(2\cdot x+1)\cdot\left(4\cdot x^2+2\cdot x+1\right)\cdot\left(4\cdot x^2-2\cdot x+1\right).$$

Vježba 759

Rastavi na faktore dvočlani izraz: $1-64\cdot x^6$.

Rezultat: $(1-2\cdot x)\cdot(1+2\cdot x)\cdot\left(1+2\cdot x+4\cdot x^2\right)\cdot\left(1-2\cdot x+4\cdot x^2\right).$

Zadatak 760 (Asterix, gimnazija)

Zadan je izraz $\left(\frac{a+1}{5\cdot a-a^2}+\frac{2\cdot a+2}{a^2-25}\right):\frac{a+1}{a^2+10\cdot a+25}$ za sve vrijednosti realnog broja a za koje je definiran. Odredite brojnik do kraja skraćenoga razlomka nakon provedenih računskih operacija u zadanome izrazu.

$A.\ a \qquad B.\ a+5 \qquad C.\ a+9 \qquad D.\ 6$

Rješenje 760

Ponovimo!

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

$$a^2 - b^2 = (a-b)\cdot(a+b) \quad , \quad \frac{a}{b}+\frac{c}{d}=\frac{a\cdot d+b\cdot c}{b\cdot d} \quad , \quad \frac{a}{b}\cdot\frac{c}{d}=\frac{a\cdot c}{b\cdot d}.$$

Zakon distribucije množenja prema zbrajanju.

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

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

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

1.inačica

$$\left(\frac{a+1}{5\cdot a-a^2}+\frac{2\cdot a+2}{a^2-25}\right):\frac{a+1}{a^2+10\cdot a+25}=\left(\frac{a+1}{5\cdot a-a^2}+\frac{2\cdot a+2}{a^2-25}\right)\cdot\frac{a^2+10\cdot a+25}{a+1}=$$

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

$$=\frac{-(a+1)\cdot(a+5)+2\cdot a\cdot(a+1)}{a\cdot(a-5)\cdot(a+5)}\cdot\frac{(a+5)^2}{a+1}=\frac{(a+1)\cdot(-(a+5)+2\cdot a)}{a\cdot(a-5)\cdot(a+5)}\cdot\frac{(a+5)^2}{a+1}=$$

$$=\frac{(a+1)\cdot(-a-5+2\cdot a)}{a\cdot(a-5)\cdot(a+5)}\cdot\frac{(a+5)^2}{a+1}=\frac{(a+1)\cdot(a-5)}{a\cdot(a-5)\cdot(a+5)}\cdot\frac{(a+5)^2}{a+1}=$$

$$=\frac{(a+1)\cdot(a-5)}{a\cdot(a-5)\cdot(a+5)}\cdot\frac{(a+5)^2}{a+1}=\frac{1}{a}\cdot\frac{a+5}{1}=\frac{a+5}{a}.$$

Brojnik je a + 5.
Odgovor je pod B.

2.inačica

$$\left(\frac{a+1}{5\cdot a-a^2}+\frac{2\cdot a+2}{a^2-25}\right):\frac{a+1}{a^2+10\cdot a+25}=\left(\frac{a+1}{5\cdot a-a^2}+\frac{2\cdot(a+1)}{a^2-25}\right)\cdot\frac{a^2+10\cdot a+25}{a+1}=$$

$$=(a+1)\cdot\left(\frac{1}{5\cdot a-a^2}+\frac{2}{a^2-25}\right)\cdot\frac{(a+5)^2}{a+1}=(a+1)\cdot\left(\frac{1}{5\cdot a-a^2}+\frac{2}{a^2-25}\right)\cdot\frac{(a+5)^2}{a+1}=$$

$$=\left(\frac{1}{5\cdot a-a^2}+\frac{2}{a^2-25}\right)\cdot\frac{(a+5)^2}{1}=\left(\frac{1}{-a\cdot(a-5)}+\frac{2}{(a-5)\cdot(a+5)}\right)\cdot\frac{(a+5)^2}{1}=$$

$$=\frac{-(a+5)+2\cdot a}{a\cdot(a-5)\cdot(a+5)}\cdot\frac{(a+5)^2}{1}=\frac{-a-5+2\cdot a}{a\cdot(a-5)\cdot(a+5)}\cdot\frac{(a+5)^2}{1}=\frac{a-5}{a\cdot(a-5)\cdot(a+5)}\cdot\frac{(a+5)^2}{1}=$$

$$=\frac{a-5}{a\cdot(a-5)\cdot(a+5)}\cdot\frac{(a+5)^2}{1}=\frac{1}{a}\cdot\frac{a+5}{1}=\frac{a+5}{a}.$$

Brojnik je a + 5.
Odgovor je pod B.

Vježba 760

Zadan je izraz $\left(\frac{a+1}{5\cdot a-a^2}+\frac{2\cdot a+2}{a^2-25}\right):\frac{a+1}{a^2+10\cdot a+25}$ za sve vrijednosti realnog broja a za koje je definiran. Odredite nazivnik do kraja skraćenoga razlomka nakon provedenih računskih operacija u zadanome izrazu.

$A.\ a$ $B.\ a+5$ $C.\ a+9$ $D.\ 6$

Rezultat: A.