Zadatak 801 (Mira, gimnazija)

Izračunati: $\left(a^{-1}+b^{-1}\right)^{-1}:\left(a^{-1}-b^{-1}\right)^{-1}$, $a, b \neq 0$.

A. $\frac{b-a}{b+a}$ B. $\frac{a-b}{a+b}$ C. $\frac{a}{a+b}$ D. $\frac{b-a}{b}$

Rješenje 801

Ponovimo!

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

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

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

$$\left(a^{-1}+b^{-1}\right)^{-1}:\left(a^{-1}-b^{-1}\right)^{-1}=\frac{\left(a^{-1}+b^{-1}\right)^{-1}}{\left(a^{-1}-b^{-1}\right)^{-1}}=\frac{a^{-1}-b^{-1}}{a^{-1}+b^{-1}}=\frac{\frac{1}{a}-\frac{1}{b}}{\frac{1}{a}+\frac{1}{b}}=$$

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

Odgovor je pod A.

2.inačica

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

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

Odgovor je pod A.

Vježba 801

Izračunati: $\left(a^{-1}-b^{-1}\right)^{-1}:\left(a^{-1}+b^{-1}\right)^{-1}$, $a, b \neq 0$.

A. $\frac{b+a}{b-a}$ B. $\frac{a-b}{a+b}$ C. $\frac{a}{a+b}$ D. $\frac{b-a}{b}$

Rezultat: A.

Zadatak 802 (Tomislav, tehnička škola)

Pojednostavni razlomak: $\dfrac{a-\dfrac{a\cdot\left(b^2-a\right)}{b^2}}{1-\dfrac{b^2-a}{b^2}}$.

$A.\ a\cdot b \qquad B.\ b \qquad C.\ a \qquad D.\ \dfrac{a}{b}$

Rješenje 802

Ponovimo!

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

$$\frac{a^n}{a^m}=a^{n-m}.$$

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

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

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

Zakon distribucije množenja prema zbrajanju.

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

Proširiti razlomak znači brojnik i nazivnik tog razlomka pomnožiti istim brojem različitim od nule i jedinice

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

1.inačica

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

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

$$=\frac{a^2}{a}=\frac{a^2}{a}=a.$$

Odgovor je pod C.

2.inačica

$$\frac{a-\frac{a\cdot\left(b^2-a\right)}{b^2}}{1-\frac{b^2-a}{b^2}}=\left[\begin{array}{l}\text{proširimo}\\ \text{razlomak}\end{array}\right]=\frac{a-\frac{a\cdot\left(b^2-a\right)}{b^2}}{1-\frac{b^2-a}{b^2}}\cdot\frac{b^2}{b^2}=\frac{b^2\cdot\left(a-\frac{a\cdot\left(b^2-a\right)}{b^2}\right)}{b^2\cdot\left(1-\frac{b^2-a}{b^2}\right)}=$$

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

$$=\frac{a^2}{a}=\frac{a^2}{a}=a.$$

Odgovor je pod C.

Vježba 802

Pojednostavni razlomak: $\dfrac{a+\dfrac{a\cdot\left(a-b^2\right)}{b^2}}{1+\dfrac{a-b^2}{b^2}}$.

A. $a\cdot b$ *B.* b *C.* a *D.* $\dfrac{a}{b}$

Rezultat: C.

Zadatak 803 (Ana, srednja škola)

Pojednostavni izraz: $\left(\dfrac{x+3}{1-y}\right)^n\cdot\left(\dfrac{1-y^2}{x^2-9}\right)^n$, $y\neq 1$, $x\neq\pm 3$.

Rješenje 803

Ponovimo!

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

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

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

$$\left(\frac{x+3}{1-y}\right)^n\cdot\left(\frac{1-y^2}{x^2-9}\right)^n=\left(\frac{x+3}{1-y}\cdot\frac{1-y^2}{x^2-9}\right)^n=\left(\frac{x+3}{1-y}\cdot\frac{\left(1-y\right)\cdot\left(1+y\right)}{\left(x-3\right)\cdot\left(x+3\right)}\right)^n=$$

$$=\left(\frac{x+3}{1-y}\cdot\frac{\left(1-y\right)\cdot\left(1+y\right)}{\left(x-3\right)\cdot\left(x+3\right)}\right)^n=\left(\frac{1}{1}\cdot\frac{1+y}{x-3}\right)^n=\left(\frac{1+y}{x-3}\right)^n.$$

Vježba 803

Pojednostavni izraz: $\left(\frac{1-y}{x+3}\right)^n \cdot \left(\frac{x^2-9}{1-y^2}\right)^n$, $y \neq \pm 1$, $x \neq -3$.

Rezultat: $\left(\frac{x-3}{1+y}\right)^n$.

Zadatak 804 (Marina, ekonomska škola)

Pojednostavni dvojni razlomak: $\dfrac{\frac{(x-y)^2}{x+y}}{\frac{x^2-y^2}{x^2+2\cdot x\cdot y+y^2}}$.

Rješenje 804

Ponovimo!

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

$a^n \cdot b^n = (a\cdot b)^n$, $\frac{a^n}{a^m} = a^{n-m}$.

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

$$\frac{\frac{(x-y)^2}{x+y}}{\frac{x^2-y^2}{x^2+2\cdot x\cdot y+y^2}} = \frac{\frac{(x-y)^2}{x+y}}{\frac{(x-y)\cdot(x+y)}{(x+y)^2}} = \frac{\frac{(x-y)^2}{x+y}}{\frac{(x-y)\cdot(x+y)}{(x+y)^2}} = \frac{\frac{x-y}{x+y}}{\frac{x+y}{(x+y)^2}} = \frac{\frac{x-y}{x+y}}{\frac{x+y}{(x+y)^{22}}} =$$

$$= \frac{\frac{x-y}{x+y}}{\frac{1}{x+y}} = \frac{\frac{x-y}{x+y}}{\frac{1}{x+y}} = \frac{x-y}{\frac{1}{1}} = x-y.$$

2.inačica

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

$$= \frac{(x-y)\cdot(x-y)\cdot(x+y)\cdot(x+y)}{(x-y)\cdot(x+y)\cdot(x+y)} = \frac{(x-y)\cdot(x-y)\cdot(x+y)\cdot(x+y)}{(x-y)\cdot(x+y)\cdot(x+y)} = x-y.$$

3.inačica

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

$$=\frac{\left((x-y)\cdot(x+y)\right)^2}{(x+y)\cdot\left(x^2-y^2\right)}=\frac{\left(x^2-y^2\right)^2}{(x+y)\cdot\left(x^2-y^2\right)}=\frac{\left(x^2-y^2\right)^{22}}{(x+y)\cdot\left(x^2-y^2\right)}=\frac{x^2-y^2}{x+y}=$$

$$=\frac{(x-y)\cdot(x+y)}{x+y}=\frac{(x-y)\cdot(x+y)}{x+y}=x-y.$$

4.inačica

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

$$=\frac{(x-y)^2\cdot(x+y)^2}{(x-y)\cdot(x+y)\cdot(x+y)}=x-y.$$

Vježba 804

Pojednostavni dvojni razlomak: $\frac{\frac{x^2-y^2}{x^2+2\cdot x\cdot y+y^2}}{\frac{(x-y)^2}{x+y}}$.

Rezultat: $\frac{1}{x-y}$.