

Zadatak 801 (Mira, gimnazija)Izračunati: $(a^{-1} + b^{-1})^{-1} : (a^{-1} - b^{-1})^{-1}$, $a, b \neq 0$.

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!

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

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

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

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

1. inačica

$$\begin{aligned} (a^{-1} + b^{-1})^{-1} : (a^{-1} - b^{-1})^{-1} &= \frac{(a^{-1} + b^{-1})^{-1}}{(a^{-1} - b^{-1})^{-1}} = \frac{\frac{1}{\frac{1}{a} + \frac{1}{b}}}{\frac{1}{\frac{1}{a} - \frac{1}{b}}} = \\ &= \frac{\frac{b-a}{a \cdot b}}{\frac{b-a}{a \cdot b}} = \frac{b-a}{b+a} = \frac{b-a}{b+a}. \end{aligned}$$

Odgovor je pod A.

2. inačica

$$\begin{aligned} (a^{-1} + b^{-1})^{-1} : (a^{-1} - b^{-1})^{-1} &= \frac{(a^{-1} + b^{-1})^{-1}}{(a^{-1} - b^{-1})^{-1}} = \frac{\left(\frac{1}{a} + \frac{1}{b}\right)^{-1}}{\left(\frac{1}{a} - \frac{1}{b}\right)^{-1}} = \frac{\left(\frac{b+a}{a \cdot b}\right)^{-1}}{\left(\frac{b-a}{a \cdot b}\right)^{-1}} = \\ &= \frac{\frac{a \cdot b}{b+a}}{\frac{a \cdot b}{b-a}} = \frac{a \cdot b}{b+a} \cdot \frac{b-a}{a \cdot b} = \frac{b-a}{b+a}. \end{aligned}$$

Odgovor je pod A.

Vježba 801Izračunati: $(a^{-1} - b^{-1})^{-1} : (a^{-1} + b^{-1})^{-1}$, $a, b \neq 0$.

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)

$$\text{Pojednostavni razlomak: } \frac{a - \frac{a \cdot (b^2 - a)}{b^2}}{1 - \frac{b^2 - a}{b^2}}$$

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

Rješenje 802

Ponovimo!

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

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

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

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

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

Zakon distribucije množenja prema zbrajanju.

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

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

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

1. inačica

$$\begin{aligned} \frac{a - \frac{a \cdot (b^2 - a)}{b^2}}{1 - \frac{b^2 - a}{b^2}} &= \frac{\frac{a \cdot (b^2 - a)}{b^2}}{\frac{1 - \frac{b^2 - a}{b^2}}{1}} = \frac{\frac{a \cdot (b^2 - a)}{b^2}}{\frac{1 - \frac{b^2 - a}{b^2}}{1}} = \frac{a \cdot b^2 - a \cdot (b^2 - a)}{b^2 - (b^2 - a)} = \frac{a \cdot b^2 - a \cdot (b^2 - a)}{b^2} \\ &= \frac{a \cdot b^2 - a \cdot (b^2 - a)}{b^2 - (b^2 - a)} = \frac{a \cdot b^2 - a \cdot b^2 + a^2}{b^2 - b^2 + a} = \frac{a \cdot b^2 - a \cdot b^2 + a^2}{b^2 - b^2 + a} \\ &= \frac{a^2}{a} = \frac{a^2}{a} = a. \end{aligned}$$

Odgovor je pod C.

2. inačica

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

Odgovor je pod C.

Vježba 802

Pojednostavni razlomak: $\frac{a + \frac{a - b^2}{b^2}}{1 + \frac{a - b^2}{b^2}}$.

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

Rezultat: C.