

\*\*\*\* MLADEN SRAGA \*\*\*\*  
2011.

UNIVERZALNA ZBIRKA  
POTPUNO RIJEŠENIH ZADATAKA  
PRIRUČNIK ZA SAMOSTALNO UČENJE

# **MATEMATIKA**

# **1**

SKUP REALNIH BROJEVA

# ALGEBARSKI RAZLOMCI

**M.I.M.-SRAGA**  
 $\sqrt{a}$

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**BESPLATNA - WEB-VARIJANTA**

Tisak:

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Dodatne upute i objašnjenja možete zatražiti i na mail: [mim-sraga@zg.htnet.hr](mailto:mim-sraga@zg.htnet.hr)

Ovo je jako skraćena varijanta naše zbirke ... samo oglednih 40-ak zadataka ....

M.I.M.-SRAGA d.o.o. zadržava sva prava na reproduciranje , umnažanje , prodaju ove zbirke potpuno riješenih zadataka isključivo u okviru svog programa poduke i dopisne poduke.

**Nikakva komercijalna upotreba ove zbirke nije dozvoljena bez pismene dozvole nakladnika !**

**Ovo nisu svi zadaci iz ove zbirke ,**

**Ovo je samo manji dio od oko 12% zadataka iz kompletne zbirke ...**

I ovdje su postavljeni samo kao ogledni primjerci ....

Ali vam mogu poslužiti kao solidna vježba pred testove ili ispitivanja u školi ...

201.

$$16) \frac{a^2 + b^2}{a^4 - b^4} = \frac{a^2 + b^2}{(a^2 - b^2)(a^2 + b^2)} = \frac{1 \cdot \cancel{(a^2 + b^2)}}{(a^2 - b^2) \cancel{(a^2 + b^2)}} = \frac{1}{a^2 - b^2}$$

↓

$$a^4 - b^4 = \underbrace{(a^2)^2 - (b^2)^2}_{\text{razlika kvadrata!}} = (a^2 - b^2)(a^2 + b^2)$$

↑

$$17) \frac{a^2 - b^2}{a^4 - b^4} = \frac{a^2 - b^2}{(a^2 - b^2)(a^2 + b^2)} = \frac{1 \cdot \cancel{(a^2 - b^2)}}{\cancel{(a^2 - b^2)}(a^2 + b^2)} = \frac{1}{a^2 + b^2}$$

$$19) \frac{x - y}{(y - x)^2} = \frac{x - y}{(x - y)^2} = \frac{x - y}{(x - y) \cdot (x - y)} = \frac{1 \cdot \cancel{(x - y)}}{\cancel{(x - y)} \cdot (x - y)} = \frac{1}{x - y}$$

↓

↑

$$(a - b)^2 = (b - a)^2 \quad \text{sjetimo se ovog pravila ( pogledaj u naše formule !! )}$$

$$\begin{aligned} 20) \frac{x^2 y - xy^2}{3x^2 y^2 - 3xy^3} &= \frac{x \cdot x \cdot y - x \cdot y \cdot y}{3 \cdot x \cdot x \cdot y^2 - 3 \cdot x \cdot y^2 \cdot y^1} = \\ &= \frac{\underline{x} \cdot \underline{x} \cdot \underline{y} - \underline{x} \cdot \underline{y} \cdot \underline{y}}{\underline{3} \cdot \underline{x} \cdot \underline{x} \cdot \underline{y}^2 - \underline{3} \cdot \underline{x} \cdot \underline{y}^2 \cdot \underline{y}^1} = \\ &= \frac{x \cdot y \cdot (x - y)}{3 \cdot x \cdot y^2 \cdot (x - y)} = \frac{1 \cdot \cancel{x} \cdot \cancel{y} \cdot \cancel{(x - y)}}{3 \cdot \cancel{x} \cdot \cancel{y} \cdot \cancel{(x - y)}} = \\ &= \frac{1}{3y} \end{aligned}$$

ili kraće :

$$\frac{x^2 y - xy^2}{3x^2 y^2 - 3xy^3} = \frac{x \cdot y \cdot (x - y)}{3 \cdot x \cdot y^2 \cdot (x - y)} = \frac{1 \cdot \cancel{x} \cdot \cancel{y} \cdot \cancel{(x - y)}}{3 \cdot \cancel{x} \cdot \cancel{y} \cdot \cancel{(x - y)}} = \frac{1}{3y}$$

202.

$$3) \frac{a+b}{a^3+b^3} = \frac{a+b}{(a+b)(a^2-ab+b^2)} = \frac{\cancel{a+b}}{\cancel{a+b}(a^2-ab+b^2)} = \frac{1}{a^2-ab+b^2}$$

↓

treba prepoznati formulu za zbroj kubova

$$4) \frac{x^2-xy}{y^2-xy} = \frac{x \cdot x - x \cdot y}{y \cdot y - x \cdot y} =$$

$$= \frac{x \cdot (x-y)}{y \cdot (y-x)} = \frac{x \cdot (-y+x)}{y \cdot (y-x)} = \frac{x \cdot (-1) \cdot (y-x)}{y \cdot (y-x)} = \frac{x \cdot (-1) \cdot \cancel{(y-x)}}{y \cdot \cancel{(y-x)}} = x \cdot (-1) = -x$$

$$6) \frac{(x-y)^2}{x^2-y^2} = \frac{(x-y)(x-y)}{(x-y)(x+y)} = \frac{\cancel{(x-y)}(x-y)}{\cancel{(x-y)}(x+y)} = \frac{x-y}{x+y}$$

$$9) \frac{x^2-y^2}{x^3+y^3} = \frac{(x-y)(x+y)}{(x+y)(x^2-xy+y^2)} = \frac{(x-y)\cancel{(x+y)}}{\cancel{(x+y)}(x^2-xy+y^2)} = \frac{x-y}{x^2-xy+y^2}$$

↓

zbroj kubova

203.

$$\begin{aligned}
6.) \quad \frac{x^6 - y^6}{x^2 - y^2} &= \frac{(x^3)^2 - (y^3)^2}{(x-y)(x+y)} = \frac{(x^3 - y^3)(x^3 + y^3)}{(x-y)(x+y)} = \\
&= \frac{(x-y)(x^2 + xy + y^2)(x+y)(x^2 - xy + y^2)}{(x-y)(x+y)} = \\
&= \frac{\cancel{(x-y)}(x^2 + xy + y^2)\cancel{(x+y)}(x^2 - xy + y^2)}{\cancel{(x-y)}\cancel{(x+y)}} = \\
&= (x^2 + xy + y^2)(x^2 - xy + y^2) = \\
&= (x^2 + y^2 + xy)(x^2 + y^2 - xy) = \\
&= (x^2 + y^2)^2 - (xy)^2 = \\
&= (x^2)^2 + 2 \cdot x^2 \cdot y^2 + (y^2)^2 - x^2 y^2 = \\
&= x^4 + 2x^2 y^2 + y^4 - x^2 y^2 = x^4 + 2x^2 y^2 - 1 \cdot x^2 y^2 + y^4 = x^4 + x^2 y^2 + y^4
\end{aligned}$$

$$\begin{aligned}
8.) \quad \frac{(x-y)^2 - 1}{x^2 - x - y^2 - y} &= \frac{(x-y)^2 - 1^2}{x^2 - y^2 - x - y} = \frac{(x-y-1)(x-y+1)}{(x-y) \cdot (x+y) - 1 \cdot (x+y)} = \frac{(x-y-1)(x-y+1)}{(x+y) \cdot (x-y-1)} = \\
&= \frac{\cancel{(x-y-1)}(x-y+1)}{(x+y) \cdot \cancel{(x-y-1)}} = \frac{x-y+1}{x+y}
\end{aligned}$$

*uputa:*  $(x-y)^2 - 1 = (x-y)^2 - 1^2 = (\text{to je razlika kvadrata ....}) = (x-y-1)(x-y+1)$

204.

$$1) \frac{x^2 y}{x^2 - x^2 y} = \frac{x^2 \cdot y}{x^2 \cdot 1 - x^2 \cdot y} = \frac{x^2 \cdot y}{x^2 \cdot (1 - y)} = \frac{\cancel{x^2} \cdot y}{\cancel{x^2} \cdot (1 - y)} = \frac{y}{1 - y}$$

$$5) \frac{4x^2 y - 4xy^2}{2x^2 y - 2xy^2} = \frac{4 \cdot x \cdot x \cdot y - 4 \cdot x \cdot y \cdot y}{2 \cdot x \cdot x \cdot y - 2 \cdot x \cdot y \cdot y} = \frac{4 \cdot x \cdot y \cdot (x - y)}{2 \cdot x \cdot y \cdot (x - y)} = \frac{2 \cdot \cancel{x} \cdot \cancel{x} \cdot \cancel{y} \cdot \cancel{(x - y)}}{\cancel{2} \cdot \cancel{x} \cdot \cancel{y} \cdot \cancel{(x - y)}} = \frac{2}{1} = 2$$

ili kraće:

$$\frac{4x^2 y - 4xy^2}{2x^2 y - 2xy^2} = \frac{4 \cdot x \cdot y \cdot (x - y)}{2 \cdot x \cdot y \cdot (x - y)} = \frac{2 \cdot \cancel{x} \cdot \cancel{x} \cdot \cancel{y} \cdot \cancel{(x - y)}}{\cancel{2} \cdot \cancel{x} \cdot \cancel{y} \cdot \cancel{(x - y)}} = \frac{2}{1} = 2$$

205.

$$7) \frac{a^4 b - a^2 b^3}{a^5 b - ab^5} = \frac{a^2 \cdot a^2 \cdot b^1 - a^2 \cdot b^1 \cdot b^2}{a^1 \cdot a^4 \cdot b^1 - a^1 \cdot b^1 \cdot b^4} =$$

$$= \frac{a^2 \cdot b^1 \cdot (a^2 - b^2)}{a^1 \cdot b^1 \cdot (a^4 - b^4)} = \frac{a \cdot a \cdot b \cdot (a^2 - b^2)}{a \cdot b \cdot (a^2 - b^2)(a^2 + b^2)} = \frac{\cancel{a} \cdot a \cdot \cancel{b} \cdot \cancel{(a^2 - b^2)}}{\cancel{a} \cdot \cancel{b} \cdot \cancel{(a^2 - b^2)} \cdot (a^2 + b^2)} = \frac{a}{a^2 + b^2}$$

dodatna uputa :

$$\frac{a^4 b - a^2 b^3}{a^5 b - ab^5} = \frac{a^{2+2} \cdot b^1 - a^2 \cdot b^{1+1}}{a^{1+4} \cdot b^1 - a \cdot b^{1+4}} =$$

$$= \frac{a^2 \cdot a^2 \cdot b^1 - a^2 \cdot b^1 \cdot b^2}{a^1 \cdot a^4 \cdot b^1 - a^1 \cdot b^1 \cdot b^4} =$$

u brojniku i nazivniku podvučemo zajedničke faktore

$$= \frac{a^2 \cdot b^1 \cdot (a^2 - b^2)}{a^1 \cdot b^1 \cdot (a^4 - b^4)} =$$

izlučimo z.f. i u brojniku i u nazivniku

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

u nazivniku treba prepoznati razliku kvadrata

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

kratimo

$$= \frac{a}{a^2 + b^2}$$

206.

$$\begin{aligned}
 10) \quad \frac{(x-3)^2}{(3-x)^3} &= \frac{(x-3)(x-3)}{(3-x)(3-x)(3-x)} = \frac{(x-3)(x-3)}{(-x+3)(-x+3)(3-x)} = \frac{(x-3)(x-3)}{-1 \cdot (x-3) \cdot (-1)(x-3) \cdot (3-x)} = \\
 &= \frac{(x-3)(x-3)}{(x-3)(x-3)(3-x)} = \frac{1 \cdot \cancel{(x-3)} \cdot \cancel{(x-3)}}{\cancel{(x-3)} \cdot \cancel{(x-3)} \cdot (3-x)} = \frac{1}{3-x}
 \end{aligned}$$

$$11) \quad \frac{x^3 + y^3}{(x+y)^3} = ?$$

$$\begin{aligned}
 12) \quad \frac{x^3 - y^3}{(x-y)^3} &= \frac{(x-y)(x^2 + xy + y^2)}{(x-y)^{1+2}} = \\
 &= \frac{(x-y)(x^2 + xy + y^2)}{(x-y)^1 \cdot (x-y)^2} = \frac{\cancel{(x-y)}(x^2 + xy + y^2)}{\cancel{(x-y)} \cdot (x-y)^2} = \frac{x^2 + xy + y^2}{(x-y)^2}
 \end{aligned}$$

208.

$$9) \frac{x^2 - y^2}{x^4 - y^4} = \frac{x^2 - y^2}{(x^2)^2 - (y^2)^2} = \frac{x^2 - y^2}{(x^2 - y^2)(x^2 + y^2)} = \frac{\cancel{(x^2 - y^2)}}{\cancel{(x^2 - y^2)}(x^2 + y^2)} = \frac{1}{x^2 + y^2}$$

$$12) \frac{1 - x^2}{x^2 - 2x + 1} = \frac{1^2 - x^2}{x^2 - 2x + 1^2} =$$

$$= \frac{(1-x)(1+x)}{(x-1)^2} = \frac{(1-x)(x+1)}{(1-x)^2} = \frac{(1-x)(x+1)}{(1-x)(1-x)} = \frac{\cancel{(1-x)}(x+1)}{\cancel{(1-x)}(1-x)} = \frac{x+1}{1-x}$$

$\downarrow \qquad \qquad \uparrow$   
*pravilo kaže:*  $(a-b)^2 = (b-a)^2$

$$15) \frac{x^2 - x}{(1-x)^2} = \frac{x \cdot x - 1 \cdot x}{(x-1)^2} = \frac{x \cdot (x-1)}{(x-1)(x-1)} = \frac{x \cdot \cancel{(x-1)}}{(x-1) \cancel{(x-1)}} = \frac{x}{x-1}$$

$\downarrow \qquad \qquad \uparrow$   
*pravilo:*  $(a-b)^2 = (b-a)^2$



209.

$$\begin{aligned}
 8) \quad \frac{x^3y + 2x^2y + xy}{x^3y - xy} &= \frac{x^1 \cdot x^2 \cdot y + 2 \cdot x^1 \cdot x^1 \cdot y + x^1 \cdot y \cdot 1}{x^1 \cdot x^2 \cdot y - x^1 \cdot y \cdot 1} = \\
 &= \frac{x^1 \cdot y \cdot (x^2 + 2 \cdot x + 1)}{x^1 \cdot y \cdot (x^2 - 1)} = \frac{\cancel{x} \cdot \cancel{y} \cdot (x+1)^2}{\cancel{x} \cdot \cancel{y} \cdot (x^2 - 1^2)} = \frac{(x+1)(x+1)}{(x-1)(x+1)} = \frac{(x+1)\cancel{(x+1)}}{(x-1)\cancel{(x+1)}} = \frac{x+1}{x-1}
 \end{aligned}$$

210.

$$\begin{aligned}
 1) \quad \frac{(x-3)^2 + 12x}{x^2 - 9} &= \frac{x^2 - 2 \cdot x \cdot 3 + 3^2 + 12x}{x^2 - 3^2} = \quad \rightarrow \text{ pogledati u 57. zadatak kako se to radi ...} \\
 &= \frac{x^2 - 6x + 12x + 3^2}{(x-3)(x+3)} = \\
 &= \frac{x^2 + 6x + 3^2}{(x-3)(x+3)} = \frac{(x+3)^2}{(x-3)(x+3)} = \frac{(x+3)\cancel{(x+3)}}{(x-3)\cancel{(x+3)}} = \frac{x+3}{x-3}
 \end{aligned}$$

$$\begin{aligned}
 4) \quad \frac{(x+2)^2 - 8x}{x^2 - 5x - 6} &= \frac{x^2 + 4x + 4 - 8x}{x^2 - 3x - 2x - 6} = \frac{x^2 + 4x - 8x + 4}{x \cdot x - 3 \cdot x - 2 \cdot x - 2 \cdot 3} = \\
 &= \frac{x^2 - 4x + 4}{x \cdot (x-3) - 2 \cdot (x-3)} = \frac{(x-2)^2}{(x-3)(x-2)} = \frac{(x-2)\cancel{(x-2)}}{(x-3)\cancel{(x-2)}} = \frac{x-2}{x-3}
 \end{aligned}$$

uputa uz ovaj zadatak :

$x^2 - 5x - 6 \rightarrow$  je kvadratni trinom ...

tehnika kako se taj izraz rješava na faktore objašnjena je u 66. zadatku ove zbirke !

211.

$$\begin{aligned}
 9) \quad \frac{x^2 + y^2 - z^2 + 2xy}{x^2 + xz + xy - y - x - z} &= \frac{x^2 + 2xy + y^2 - z^2}{x \cdot (x + z + y) - (y + x + z)} = \frac{(x + y)^2 - z^2}{x \cdot (x + y + z) - 1 \cdot (y + x + z)} = \\
 &= \frac{(x + y - z)(x + y + z)}{(x + y + z) \cdot (x - 1)} = \frac{(x + y - z) \cancel{(x + y + z)}}{\cancel{(x + y + z)} \cdot (x - 1)} = \frac{x + y - z}{x - 1}
 \end{aligned}$$

212.

$$\begin{aligned}
 1) \quad \frac{x^8 - y^8}{x^3 + xy^2 - x^2y - y^3} &= \frac{(x^4)^2 - (y^4)^2}{x^1 \cdot x^2 + x \cdot y^2 - y \cdot x^2 - y^1 \cdot y^2} = \\
 &= \frac{(x^4 - y^4)(x^4 + y^4)}{x \cdot (x^2 + y^2) - y \cdot (x^2 + y^2)} = \\
 &= \frac{[(x^2)^2 - (y^2)^2](x^4 + y^4)}{(x^2 + y^2)(x - y)} = \\
 &= \frac{(x^2 - y^2)(x^2 + y^2)(x^4 + y^4)}{(x^2 + y^2)(x - y)} = \frac{(x^2 - y^2) \cancel{(x^2 + y^2)} (x^4 + y^4)}{\cancel{(x^2 + y^2)} (x - y)} = \\
 &= \frac{(x^2 - y^2)(x^4 + y^4)}{(x - y)} = \frac{\cancel{(x - y)} (x + y)(x^4 + y^4)}{\cancel{(x - y)}} = \\
 &= (x + y)(x^4 + y^4)
 \end{aligned}$$

213.

U ovom zadatku se ponovo susrećemo sa KVADRATNIM TRINOMOM

u zadatku br. 66. smo dali detaljnu uputu kako se kvadratni trinom rastavlja na faktore ....

$$1) \frac{x^2 - 4}{x^2 - x - 2} = \frac{x^2 - 2^2}{x^2 - 2x + 1x - 2} =$$

$$= \frac{(x-2)(x+2)}{x \cdot (x-2) + 1 \cdot (x-2)} = \frac{(x-2)(x+2)}{(x-2)(x+1)} = \frac{\cancel{(x-2)}(x+2)}{\cancel{(x-2)}(x+1)} = \frac{x+2}{x+1}$$

⇕

uputa kako rastaviti

kvadratni trinom iz brojnika:

$$x^2 - x - 2 = \left. \begin{array}{l} a = 1 \\ b = -1 \\ c = -2 \end{array} \right\} \Rightarrow \left. \begin{array}{l} m + n = b \\ m \cdot n = a \cdot c \end{array} \right\} \Rightarrow \left. \begin{array}{l} m + n = -1 \\ m \cdot n = 1 \cdot (-2) \end{array} \right\} \Rightarrow \left. \begin{array}{l} m + n = -1 \\ m \cdot n = -2 \end{array} \right\} \Rightarrow m = -2, n = 1$$

$$m = -2, n = 1$$

$$x^2 - x - 2 = x^2 - 2x + 1x - 2 =$$

$$= x(x-2) - 1(x-2) =$$

$$= x(x-2) - 1(x-2) =$$

$$= (x-2)(x-1)$$

$$2) \frac{4x^2 - 4x + 1}{2x^2 - 5x + 2} = \frac{2^2 \cdot x^2 - 2 \cdot 2x \cdot 1 + 1^2}{2x^2 - 4x - 1x + 2} = \frac{(2x)^2 - 2 \cdot 2x \cdot 1 + 1^2}{2 \cdot x \cdot x - 2 \cdot 2 \cdot x - 1 \cdot x + 2} = \frac{(2x-1)^2}{2x \cdot (x-2) - 1 \cdot (x-2)} =$$

$$= \frac{(2x-1)(2x-1)}{(x-2)(2x-1)} = \frac{(2x-1)\cancel{(2x-1)}}{(x-2)\cancel{(2x-1)}} = \frac{2x-1}{x-2}$$

⇕

uputa kako rastaviti

kvadratni trinom iz brojnika:

$$2x^2 - 5x + 2 = \left. \begin{array}{l} a = 2 \\ b = -5 \\ c = 2 \end{array} \right\} \Rightarrow \left. \begin{array}{l} m + n = b \\ m \cdot n = a \cdot c \end{array} \right\} \Rightarrow \left. \begin{array}{l} m + n = -5 \\ m \cdot n = 2 \cdot 2 \end{array} \right\} \Rightarrow \left. \begin{array}{l} m + n = -5 \\ m \cdot n = 4 \end{array} \right\} \Rightarrow m = -4, n = -1$$

$$m = -4, n = -1$$

$$2x^2 - 5x + 2 = 2x^2 - 4x - 1x + 2 =$$

$$= 2x(x-2) - 1(x-2) =$$

$$= 2x(x-2) - 1(x-2) =$$

$$= (x-2)(2x-1)$$

214.

$$\begin{aligned}
4) \quad \frac{x^3 - x^2y + xy^2 - x^3}{x^3 + x^2y + xy^2 + y^3} &= \frac{x^2 \cdot x^1 - x^2 \cdot y + x^1 \cdot y^2 - x^1 \cdot x^2}{x^2 \cdot x^1 + x^2 \cdot y + x \cdot y^2 + y^2 \cdot y^1} = \\
&= \frac{x^2 \cdot (x - y) + x \cdot (y^2 - x^2)}{x^2 \cdot (x + y) + y^2 \cdot (x + y)} = \\
&= \frac{x \cdot x \cdot (x - y) + x \cdot (y - x)(y + x)}{(x + y)(x^2 + y^2)} = \frac{x \cdot x \cdot (x - y) - x \cdot (x - y)(y + x)}{(x + y)(x^2 + y^2)} = \\
&= \frac{x \cdot (x - y)[x - (y + x)]}{(x + y)(x^2 + y^2)} = \\
&= \frac{x \cdot (x - y)(x - y - x)}{(x + y)(x^2 + y^2)} = \frac{x \cdot (x - y)(-y)}{(x + y)(x^2 + y^2)} = \\
&= \frac{-xy(x - y)}{(x + y)(x^2 + y^2)} = \frac{-xy \cdot (-1) \cdot (-x + y)}{(x + y)(x^2 + y^2)} = \frac{+xy \cdot (y - x)}{(x + y)(x^2 + y^2)} = \\
&= \frac{xy(y - x)}{(x + y)(x^2 + y^2)}
\end{aligned}$$

215.

$$1) \frac{a^x + a^{x+1}}{a^x - a^{x+1}} = \frac{a^x \cdot 1 + a^x \cdot a^1}{a^x \cdot 1 - a^x \cdot a^1} = \frac{a^x \cdot (1+a)}{a^x \cdot (1-a)} = \frac{\cancel{a^x} \cdot (1+a)}{\cancel{a^x} \cdot (1-a)} = \frac{1+a}{1-a}$$

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

$$3) \frac{a^{x+2} - a^x}{a^{x+1} + a^x} = \frac{a^x \cdot a^2 - 1 \cdot a^x}{a^x \cdot a^1 + 1 \cdot a^x} =$$

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

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

$$= \frac{\cancel{a^x} \cdot (a^4 - 1)}{\cancel{a^x} \cdot (a^3 - a^2 + a - 1)} =$$

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

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

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

$$= \frac{a+1}{1} = a+1$$

221.

$$\begin{aligned} 4) \quad \frac{x-1}{xy^2} + \frac{1-y}{x^2y} &= \frac{x-1}{x \cdot y \cdot y} + \frac{1-y}{x \cdot x \cdot y} = \frac{x \cdot (x-1) + y \cdot (1-y)}{x \cdot x \cdot y \cdot y} = \frac{x^2 - x + y - y^2}{x^2y^2} = \\ &= \frac{x^2 - y^2 - x + y}{x^2y^2} = \frac{(x-y)(x+y) - 1 \cdot (x-y)}{x^2y^2} = \frac{(x-y)(x+y-1)}{x^2y^2} \end{aligned}$$

5

$$\begin{aligned} 7) \quad \frac{2}{x-3} - \frac{4}{x+3} + \frac{3x}{x^2-9} &= \frac{2}{x-3} - \frac{4}{x+3} + \frac{3x}{x^2-9} = \frac{2}{x-3} - \frac{4}{x+3} + \frac{3x}{(x-3)(x+3)} = \\ &= \frac{2(x+3) - 4(x-3) + 3x}{(x-3)(x+3)} = \frac{2x+6-4x+12+3x}{(x-3)(x+3)} = \\ &= \frac{2x-4x+3x+6+12}{x^2-3^2} = \frac{x+18}{x^2-9} \end{aligned}$$

222.

$$\begin{aligned}
 2) \quad \frac{5x^2y^4z^4}{6a^3b^4c^5} \cdot \frac{18a^5b^4c}{25xy^2z^4} &= \frac{5 \cdot x \cdot x \cdot y^2 \cdot y^2 \cdot z^4}{6 \cdot a^3 \cdot b^4 \cdot c^1 \cdot c^4} \cdot \frac{6 \cdot 3 \cdot a^3 \cdot a^2 \cdot b^4 \cdot c}{5 \cdot 5 \cdot x \cdot y^2 \cdot z^4} = \\
 &= \frac{\cancel{5} \cdot \cancel{x} \cdot x \cdot \cancel{y^2} \cdot y^2 \cdot \cancel{z^4}}{\cancel{6} \cdot \cancel{a^3} \cdot \cancel{b^4} \cdot \cancel{c^1} \cdot c^4} \cdot \frac{\cancel{6} \cdot 3 \cdot \cancel{a^3} \cdot a^2 \cdot \cancel{b^4} \cdot \cancel{c}}{\cancel{5} \cdot 5 \cdot \cancel{x} \cdot y^2 \cdot \cancel{z^4}} = \\
 &= \frac{xy^2 \cdot 3 \cdot a^2}{c^4 \cdot 5} = \frac{3xy^2a^2}{5c^4}
 \end{aligned}$$

$$\begin{aligned}
 5) \quad \frac{x^3 + y^3}{x - y} \cdot \frac{x^3 - y^3}{x^2 - xy + y^2} &= \frac{(x + y)(x^2 - xy + y^2)}{(x - y)} \cdot \frac{(x - y)(x^2 + xy + y^2)}{x^2 - xy + y^2} = \\
 &= \frac{(x + y) \cancel{(x^2 - xy + y^2)}}{\cancel{(x - y)}} \cdot \frac{\cancel{(x - y)} (x^2 + xy + y^2)}{\cancel{(x^2 - xy + y^2)}} = (x + y)(x^2 + xy + y^2)
 \end{aligned}$$

225.

$$\begin{aligned}
 4) \quad \frac{x^2 + 4x + 4}{x^2 - y^2} : \frac{x^2 - 4}{x^2 - 2xy + y^2} &= \frac{x^2 + 2 \cdot 2 \cdot x + 2^2}{(x-y)(x+y)} \cdot \frac{x^2 - 2xy + y^2}{x^2 - 2^2} = \frac{(x+2)^2}{(x-y)(x+y)} \cdot \frac{(x-y)^2}{(x-2)(x+2)} = \\
 &= \frac{(x+2)\cancel{(x+2)}}{\cancel{(x-y)}(x+y)} \cdot \frac{\cancel{(x-y)}(x-y)}{(x-2)\cancel{(x+2)}} = \frac{(x+2)(x-y)}{(x+y)(x-2)}
 \end{aligned}$$

$$\begin{aligned}
 5) \quad \frac{(x-1)^2 - y^2}{(x+1)^2 - y^2} : \frac{x^2 - x - xy}{x^2 + x - xy} &= \frac{(x-1-y)(x-1+y)}{(x+1-y)(x+1+y)} \cdot \frac{x^2 + x - xy}{x^2 - x - xy} = \\
 &= \frac{(x-1-y)(x-1+y)}{(x+1-y)(x+1+y)} \cdot \frac{x \cdot (x+1-y)}{x \cdot (x-1-y)} = \\
 &= \frac{\cancel{(x-1-y)}(x-1+y)}{\cancel{(x+1-y)}(x+1+y)} \cdot \frac{\cancel{(x+1-y)}}{\cancel{(x-1-y)}} = \\
 &= \frac{x-1+y}{x+1+y} = \frac{x+y-1}{x+y+1}
 \end{aligned}$$

$$\begin{aligned}
 8) \quad \left( \frac{x-y}{x+y} + \frac{x+y}{x+y} \right) : \frac{x^3 + xy^2}{x^3 - xy^2} &= \frac{(x-y)(x-y) + (x+y)(x+y)}{(x+y) \cdot (x-y)} \cdot \frac{x^3 - xy^2}{x^3 + xy^2} = \\
 &= \frac{(x-y)^2 + (x+y)^2}{x^2 - y^2} \cdot \frac{x(x^2 - y^2)}{x(x^2 + y^2)} = \\
 &= \frac{x^2 - 2xy + y^2 + x^2 + 2xy + y^2}{x^2 - y^2} \cdot \frac{(x^2 - y^2)}{(x^2 + y^2)} = \\
 &= \frac{2x^2 + 2y^2}{x^2 - y^2} \cdot \frac{x^2 - y^2}{x^2 + y^2} = \frac{2\cancel{(x^2 + y^2)}}{\cancel{(x^2 - y^2)}} \cdot \frac{\cancel{(x^2 - y^2)}}{\cancel{(x^2 + y^2)}} = 2
 \end{aligned}$$



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Autor: Mladen Sraga  
izdavač: M.I.M.-Sraga

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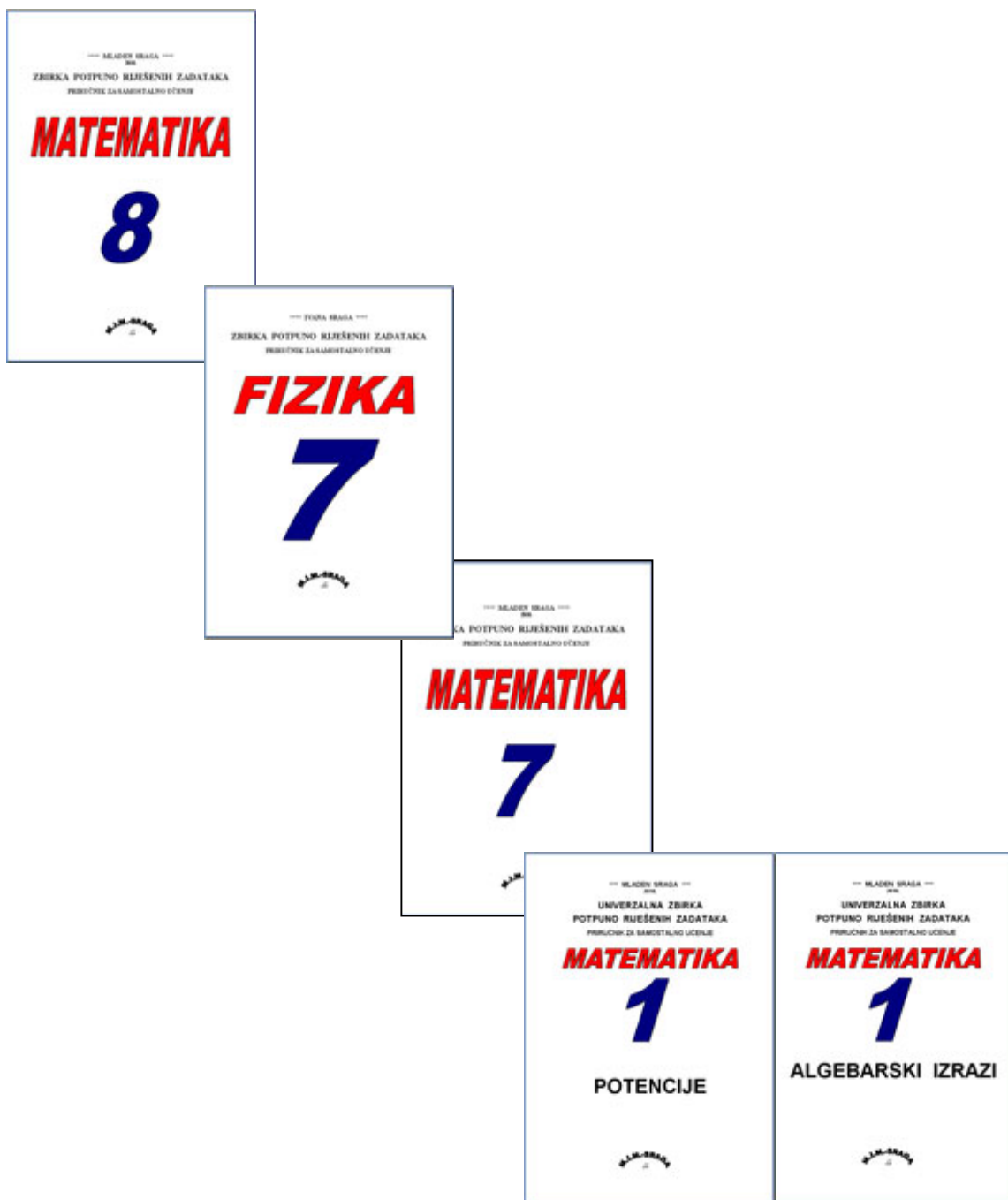
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79.

Tehnika rješavanja ovog zadatka je sljedeća: brojnik i nazivnik rastavimo na faktore i kratimo...

$$1.) \quad \frac{xy}{x-xy} = \frac{x \cdot y}{x \cdot (1-y)} = \frac{\cancel{x} \cdot y}{\cancel{x} \cdot (1-y)} = \frac{y}{1-y}$$

-rastavimo na faktore, kratimo  $x$  u brojniku i nazivniku

Ovi prvi zadaci su jednostavni, samorastavimo na faktore i kratimo

$$2.) \quad \frac{ab^3}{a^2b-ab^2} = \frac{a \cdot b \cdot b^2}{a \cdot a \cdot b - a \cdot b \cdot b} = \frac{a \cdot b \cdot b^2}{a \cdot b \cdot (a-b)} = \text{kratimo: } \frac{\cancel{a} \cdot \cancel{b} \cdot b^2}{\cancel{a} \cdot \cancel{b} \cdot (a-b)} = \frac{b^2}{a-b}$$

$$3.) \quad \frac{ax-bx}{ax+bx} = \frac{x \cdot (a-b)}{x \cdot (a+b)} = \frac{\cancel{x} \cdot (a-b)}{\cancel{x} \cdot (a+b)} = \frac{a-b}{a+b}$$

kratimo

$$4.) \quad \frac{xz-yz}{z^2+3z} = \frac{z \cdot (x-y)}{z \cdot (z+3)} = \frac{\cancel{z} \cdot (x-y)}{\cancel{z} \cdot (z+3)} = \frac{x-y}{z+3}$$

kratimo

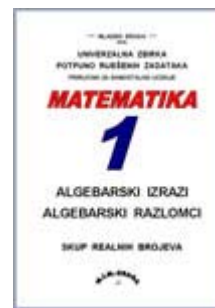
$$5.) \quad \frac{a^2+a}{ax-ay} = \frac{a \cdot a + a}{a \cdot (x-y)} = \frac{a \cdot (a+1)}{a \cdot (x-y)} = \frac{\cancel{a} \cdot (a+1)}{\cancel{a} \cdot (x-y)} = \frac{a+1}{x-y}$$

$$6.) \quad \frac{a^2-2ab}{ab-2b^2} = \frac{a \cdot a - 2 \cdot a \cdot b}{a \cdot b - 2 \cdot b \cdot b} = \frac{a \cdot (a-2b)}{b \cdot (a-2b)} = \frac{a \cdot \cancel{(a-2b)}}{b \cdot \cancel{(a-2b)}} = \frac{a}{b}$$

$$7.) \quad \frac{3a^2+4ab}{9a^2b-16b^3} = \frac{a \cdot (3a+4b)}{\underbrace{b(9a^2-16b^2)}_{R.KVADRATA}} = \frac{a(3a+4b)}{b(3a-4b)(3a+4b)} = \frac{a}{b(3a-4b)}$$

$$8.) \quad \frac{16x^3-36xy^2}{6xy-9y^2} = \frac{4x \cdot \overbrace{(4x^2-9y^2)}^{R.KVADRATA}}{3y(2x-3y)} = \frac{4x(2x-3y)(2x+3y)}{3y(2x-3y)} = \frac{4x(2x+3y)}{3y}$$

kratimo



$$10. \quad \frac{12a^5 - 27a^3b^2}{8a^3b - 12a^2b^2} = \frac{3a^3(4a^2 - b^2)}{4a^2b(2a - 3b)} = \frac{3a(2a - 3b)(2a + 3b)}{4b(2a - 3b)} = \frac{3a(2a + 3b)}{4b}$$

kratimo  $a^2$  sa  $a^3$                       kratimo

još jednom isti zadatak:

$$\begin{aligned} \frac{12a^5 - 27a^3b^2}{8a^3b - 12a^2b^2} &= \frac{3a^3(4a^2 - b^2)}{4a^2b(2a - 3b)} = \\ &= \frac{3 \cdot \cancel{a^2} \cdot a \cdot (4a^2 - b^2)}{4 \cdot \cancel{a^2} \cdot b \cdot (2a - 3b)} = \frac{3 \cdot \cancel{a^2} \cdot a \cdot (4a^2 - b^2)}{4 \cdot \cancel{a^2} \cdot b \cdot (2a - 3b)} = \\ &= \frac{3a(2a - 3b)(2a + 3b)}{4b(2a - 3b)} = \frac{3a \cancel{(2a - 3b)} (2a + 3b)}{4b \cancel{(2a - 3b)}} = \\ &= \frac{3a(2a + 3b)}{4b} \end{aligned}$$

$$11. \quad \frac{2a^4 - 8a^3b + 8a^2b^2}{a^4 - 2a^3b} = \frac{2a^2(a^2 - 4ab + 4b^2)}{a^3(a - 2b)} = \text{treba prepoznati kvadrat razlike}$$

$$= \frac{2 \cdot \cancel{a^2} \cdot (a - 2b)^2}{\cancel{a^2} \cdot a \cdot (a - 2b)} = \text{rastavimo: } (a - 2b)^2 = (a - 2b) \cdot (a - 2b)$$

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

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

$$12. \quad \frac{a^2 - 6a + 9}{a^2 - 9} = \frac{(a - 3)^2}{(a - 3)(a + 3)} = \frac{\cancel{(a - 3)} \cdot (a - 3)}{\cancel{(a - 3)} \cdot (a + 3)} = \frac{(a - 3)}{(a + 3)}$$

$$13. \quad \frac{a^2 - 4}{a^2 + a - 6} = \frac{(a - 2)(a + 2)}{(a - 2)(a + 3)} = \frac{\cancel{(a - 2)} (a + 2)}{\cancel{(a - 2)} (a + 3)} = \frac{a + 2}{a + 3}$$

↓

$$a^2 + a - 6 = a^2 + 3a - 2a - 6^2 - a(a + 3) - 2(a + 3) = (a + 3)(a - 2)$$

$$14. \quad \frac{a^2 - b^2}{a^3 + b^3} = \frac{(a - b)(a + b)}{(a + b)(a^2 - ab + b^2)} = \frac{(a - b) \cancel{(a + b)}}{\cancel{(a + b)} (a^2 - ab + b^2)} = \frac{a - b}{a^2 - ab + b^2}$$



$$\begin{aligned}
 17.) \quad \frac{a^2 - b^2}{a^3 + ab^2 - a^2b - b^3} &= \frac{(a-b)(a+b)}{a^3 - a^2b + ab^2 - b^3} = \\
 &= \frac{(a-b)(a+b)}{a^2(a-b) + b^2(a-b)} = \\
 &= \frac{(a-b)(a+b)}{(a-b)(a^2 + b^2)} = \frac{a+b}{a^2 + b^2}
 \end{aligned}$$

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

19.)

$$\begin{aligned}
 \frac{\overbrace{a^2 + 2ab + b^2}^{KV. ZBROJA} - c^2}{(a+b+c)a + (a+b+c)c} &= \frac{\overbrace{(a+b)^2 - c^2}^{R.KV.}}{(a+b+c)(a+c)} = \\
 &= \frac{(a+b-c)(a+b+c)}{(a+b+c)(a+c)} = \text{kratimo} \\
 &= \frac{a+b-c}{a+c}
 \end{aligned}$$

$$\begin{aligned}
 20.) \quad \frac{a^2 + b^2 - c^2 + 2ab}{a^2 - b^2 + c^2 + 2ac} &= \frac{a^2 + 2ab + b^2 - c^2}{a^2 + 2ac + c^2 - b^2} = \\
 &= \frac{(a+b)^2 - c^2}{(a+c)^2 - b^2} = \\
 &= \frac{(a+b-c)(a+b+c)}{(a+c-b)(a+b+c)} = \\
 &= \frac{(a+b-c)(a+b+c)}{(a-b+c)(a+b+c)} = \frac{(a+b-c) \cancel{(a+b+c)}}{(a-b+c) \cancel{(a+b+c)}} = \\
 &= \frac{a+b-c}{a-b+c}
 \end{aligned}$$



$$\begin{aligned}
 21.) \quad \frac{a^2 + 6a + 5}{a^3 + 5a^2 - a - 5} &= \frac{a^2 + a + 5a + 5}{a^3 - a + 5a^2 - 5} = \\
 &= \frac{a(a+1) + 5(a+1)}{a(a^2 - 1) + 5(a^2 - 1)} = \\
 &= \frac{(a+1)(a+5)}{(a^2 - 1)(a+5)} = \\
 &= \frac{(a+1)(a+5)}{(a+1)(a-1)(a+5)} = \frac{\cancel{(a+1)} \cancel{(a+5)}}{\cancel{(a+1)} (a-1) \cancel{(a+5)}} = \\
 &= \frac{1}{a-1}
 \end{aligned}$$

$$\begin{aligned}
 22.) \quad \frac{x^2 + 2x + 2}{(x+1)^4 - 1} &= \frac{x^2 + 2x + 2}{((x+1)^2 - 1)((x+1)^2 + 1)} = \\
 &= \frac{x^2 + 2x + 2}{(x^2 + 2x + 1 - 1)(x^2 + 2x + 1 + 1)} = \\
 &= \frac{x^2 + 2x + 2}{(x^2 + 2x)(x^2 + 2x + 2)} = \\
 &= \frac{1 \cdot \cancel{(x^2 + 2x + 2)}}{(x^2 + 2x) \cancel{(x^2 + 2x + 2)}} = \\
 &= \frac{1}{x^2 + 2x} = \\
 &= \frac{1}{x(x+2)}
 \end{aligned}$$

$$\begin{aligned}
 23.) \quad \frac{(2a)(a-1)^2 - 4(2a-3)}{(a+1)^2(a-3)} &= \frac{(2a-3)((a-1)^2 - 4)}{(a+1)^2(a-3)} = \\
 &= \frac{(2a-3)(a-1-2)(a-1+2)}{(a+1)(a+1)(a-3)} = \\
 &= \frac{(2a-3)(a-3)(a+1)}{(2+1)(a+1)(a-3)} = \\
 &= \frac{2a-3}{a+1}
 \end{aligned}$$



$$\begin{aligned}
 24.) \quad \frac{(4a^2 - 4a + 1)(a^2 - 2a - 3)}{(a^2 - 6a + 9)[a^2 - 1 + a(a+1)]} &= \frac{(2a-1)^2(a^2 + a - 3a - 3)}{(a-3)^2[(a-1)(a+1) + a(a+1)]} = \\
 &= \frac{(2a-1)^2(a(a+1) - 3(a+1))}{(a-3)^2(a+1)(a-1+a)} = \\
 &= \frac{(2a-1)^2(a+1)(a-3)}{(a-3)^2(a+1)(2a-1)} = \frac{2a-1}{a-3}
 \end{aligned}$$

$$\begin{aligned}
 25.) \quad \frac{x^2 + 4xy + 4y^2 - 4}{x^2 4y^2 - 2(x-2y)} &= \frac{(x+2y)^2 - 4}{(x-2y)(x+2y) - 2(x-2y)} = \frac{(x+2y-2)(x+2y+2)}{(x-2y)(x+2y-2)} = \\
 &= \frac{x+2y+2}{x-2y}
 \end{aligned}$$

$$\begin{aligned}
 26.) \quad \frac{(a^2 - b^2 - c^2 - 2bc)(a+b-c)}{(a+b+c)(a^2 - b^2 + c^2 - 2ac)} &= \frac{[a^2 - (b^2 + 2bc + c^2)](a+b-c)}{(a+b+c)(a^2 - 2ac + c^2 - b^2)} = \\
 &= \frac{[a^2 - (b+c)^2](a+b-c)}{(a+b+c)[(a-c)^2 - b^2]} = \\
 &= \frac{[a - (b+c)](a+b+c)(a+b-c)}{(a+b+c)(a-c-b)(a-c+b)} = \\
 &= \frac{(a-b-c)(a+b-c)}{(a-b-c)(a+b-c)} = 1
 \end{aligned}$$

$$\begin{aligned}
 27.) \quad \frac{a^2 + b^2 + c^2 + 2ab + 2bc + 2ac}{a^2 - b^2 - c^2 - 2bc} &= \frac{(a+b+c)(a+b+c)}{a^2(b^2 + 2bc + c^2)} = \frac{(a+b+c)(a+b+c)}{a^2 - (b+c)^2} = \\
 &= \frac{(a+b+c)(a+b+c)}{[a - (b+c)](a+b+c)} = \frac{a+b+c}{a-b-c}
 \end{aligned}$$

$$\begin{aligned}
 28.) \quad \frac{x^2 - 3xy + xz + 2y^2 - 2yz}{x^2 - y^2 + 2yz - z^2} &= \frac{x^2 2xy - xy + 2y^2 + z(x-2y)}{x^2 - (y^2 - 2yz + z^2)} = \\
 &= \frac{x(x-2y) - y(x-2y) + z(x-2y)}{x^2 - (y-z)^2} = \\
 &= \frac{(x-2y)(x-y+z)}{[x - (y-z)](x+y-z)} = \frac{(x-2y)(x-y+z)}{(x-y+z)(x+y-z)} = \frac{x-2y}{x+y-z}
 \end{aligned}$$

$$29.) \frac{a^2 - 3ab + ac + 2bc}{a^2 - b^2 + 2bc - c^2} = \frac{a^2 - 2ab - ab + 2b^2 + ac - 2bc}{a^2(b^2 - 2bc + c^2)} = \frac{a(a-2b) - b(a-2b) + c(a-2b)}{a^2 - (b-c)^2} =$$

$$= \frac{(a-2b)(a-b+c)}{[a-(b-c)](a+b-c)} = \frac{(a-2b)(a-b+c)}{(a-b+c)(a+b-c)} = \frac{a-2b}{a+b-c}$$

$$30.) \frac{xy \cdot (a^2 - b^2) + abx^2 - aby^2}{abx^2 + aby^2 + xy \cdot (a^2 + b^2)} = \frac{a^2x - y - b^2xy + abx^2 - aby^2}{abx^2 + aby^2 + a^2xy + b^2xy} = \frac{a^2xy + abx^2 - aby^2 - b^2xy}{aby^2 + b^2xy + abx^2 + a^2xy} =$$

$$= \frac{ax \cdot (ay + bx) - by \cdot (ay + bx)}{by \cdot (ay + bx) + ax \cdot (bx + ay)} = \frac{(ay + bx) \cdot (ax - by)}{(ay + bx) \cdot (by + ax)} = \frac{ax - by}{ax + by}$$

$$31.) \frac{3a^2x^2 + 3b^2 - 6abx + 9a^2x - 9ab}{(a^3x^3 - ab^2x) \cdot (ax - b + 3a)} = \frac{3a^2x^2 - 6abx + 3b^2 + 9a^2x - 9ab}{ax \cdot (ax - b) \cdot (ax + b) \cdot (ax - b + 3a)} =$$

$$= \frac{3 \cdot (a^2x^2 - 2abx + b^2) + 9a \cdot (ax - b)}{ax \cdot (ax - b) \cdot (ax + b) \cdot (ax - b + 3a)} =$$

$$= \frac{3 \cdot (ax - b)^2 + 9a \cdot (ax - b)}{ax \cdot (ax - b) \cdot (ax + b) \cdot (ax - b + 3a)} =$$

$$= \frac{3 \cdot (ax - b) \cdot (ax - b) + 9a \cdot (ax - b)}{ax \cdot (ax - b) \cdot (ax + b) \cdot (ax - b + 3a)} =$$

$$= \frac{(ax - b) \cdot (3 \cdot (ax - b) + 9a)}{ax \cdot (ax - b) \cdot (ax + b) \cdot (ax - b + 3a)} =$$

$$= \frac{3ax - 3b + 9a}{ax \cdot (ax + b) \cdot (ax - b + 3a)} =$$

$$= \frac{3 \cdot (ax - b + 3a)}{ax \cdot (ax + b) \cdot (ax - b + 3a)} = \frac{3}{ax \cdot (ax + b)}$$





$$\begin{aligned}
 32.) \quad \frac{2x^3 + 3x^2y - 2x - 3y}{2x^2 - 2x + 3y \cdot (x-1)} &= \frac{2x^3 - 2x + 3x^2y - 3y}{2x \cdot (x-1) + 3y \cdot (x-1)} = \\
 &= \frac{2x \cdot (x^2 - 1) + 3y \cdot (x^2 - 1)}{(x-1) \cdot (2x + 3y)} = \\
 &= \frac{(x^2 - 1) \cdot (2x + 3y)}{(x-1) \cdot (2x + 3y)} = \\
 &= \frac{(x-1) \cdot (x+1)}{(x-1)} = x+1
 \end{aligned}$$

$$\begin{aligned}
 33.) \quad \frac{3x^3 + xy^2 - 6x^2y - 2y^3}{9x^5 - xy^4 - 18x^4y + 2y^5} &= \frac{3x^3 - 6x^2y + xy^2 - 2y^3}{9x^5 - 18x^4y - xy^4 + 2y^5} = \\
 &= \frac{3x^2 \cdot (x - 2y) + y^2 \cdot (x - 2y)}{9x^4 \cdot (x - 2y) - y^4 \cdot (x - 2y)} = \\
 &= \frac{(x - 2y) \cdot (3x^2 + y^2)}{(x - 2y) \cdot (9x^4 - y^4)} = \\
 &= \frac{(3x^2 + y^2)}{(3x^2 - y^2) \cdot (3x^2 + y^2)} = \\
 &= \frac{1}{3x^2 - y^2}
 \end{aligned}$$

$$\begin{aligned}
 34.) \quad \frac{ac + ad + bc + bd - a \cdot (c + d)}{ac^2 - ad^2 + bc^2 - bd^2} &= \frac{a \cdot (c + d) + b \cdot (c + d) - a \cdot (c + d)}{ac^2 + bc^2 - ad^2 - bd^2} = \\
 &= \frac{(c + d) \cdot (a + b - a)}{c^2 \cdot (a + b) - d^2 \cdot (a + b)} = \\
 &= \frac{(c + d) \cdot b}{(a + b) \cdot (c^2 - d^2)} = \\
 &= \frac{(c + d) \cdot b}{(a + b) \cdot (c - d) \cdot (c + d)} = \\
 &= \frac{b}{(a + b) \cdot (c - d)}
 \end{aligned}$$



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za prvi razred svih srednjih škola  
Priručnik za samostalno učenje **MATEMATIKA-1-**  
SKUPU REALNIH BROJEVA:



Više informacija o toj zbirci : [www.mim-sraga.com](http://www.mim-sraga.com)

[MALA ŠKOLA MATEMATIKE NA YouTube](#)  
video instrukcije ili video poduka na:



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[MATEMATIČKE FORMULE I NJIHOVA PRIMJENA - MEMENTO iz MATEMATIKE](#)



Priručnici za samostalno učenje MATEMATIKA 2



79.

Skrati razlomke:

1.)  $\frac{xy}{x-xy} =$

2.)  $\frac{ab^3}{a^2b-ab^2} =$

3.)  $\frac{ax-bx}{ax+bx} =$

4.)  $\frac{xz-yz}{z^2+3z} =$

5.)  $\frac{a^2+a}{ax-ay} =$

6.)  $\frac{a^2-2ab}{ab-2b^2} =$

7.)  $\frac{3a^2+4ab}{9a^2b-16b^3} =$

8.)  $\frac{16x^3-36xy^2}{6xy-9y^2} =$

10.)  $\frac{12a^5-27a^3b^2}{8a^3b-12a^2b^2} =$

11.)  $\frac{2a^4-8a^3b+8a^2b^2}{a^4-2a^3b} =$

12.)  $\frac{a^2-6a+9}{a^2-9} =$

13.)  $\frac{a^2-4}{a^2+a-6} =$

14.)  $\frac{a^2-b^2}{a^3+b^3} =$

17.)  $\frac{a^2-b^2}{a^3+ab^2-a^2b-b^3} =$

18.)  $\frac{a^2-b^2}{a^2-a-b-b^2} =$

19.)  $\frac{a^2+2ab+b^2-c^2}{(a+b+c)a+(a+b+c)c} =$

20.)  $\frac{a^2+b^2-c^2+2ab}{a^2-b^2+c^2+2ac} =$

21.)  $\frac{a^2+6a+5}{a^3+5a^2-a-5} =$

22.)  $\frac{x^2+2x+2}{(x+1)^4-1} =$

23.)  $\frac{(2a)(a-1)^2-4(2a-3)}{(a+1)^2(a-3)} =$

24.)  $\frac{(4a^2-4a+1)(a^2-2a-3)}{(a^2-6a+9)[a^2-1+a(a+1)]} =$

25.)  $\frac{x^2+4xy+4y^2-4}{x^2+4y^2-2(x-2y)} =$

26.)  $\frac{(a^2-b^2-c^2-2bc)(a+b-c)}{(a+b+c)(a^2-b^2+c^2-2ac)} =$

27.)  $\frac{a^2+b^2+c^2+2ab+2bc+2ac}{a^2-b^2-c^2-2bc} =$

28.)  $\frac{x^2-3xy+xz+2y^2-2yz}{x^2-y^2+yz-z^2} =$

29.)  $\frac{a^2-3ab+ac+2bc}{a^2-b^2+2bc-c^2} =$

30.)  $\frac{xy \cdot (a^2-b^2) + abx^2 - aby^2}{abx^2 + aby^2 + xy \cdot (a^2+b^2)} =$

