

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

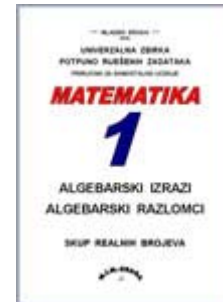
$$5.) \quad \frac{a^2+a}{ax-ay} = \frac{a \cdot a + a}{a \cdot (x-y)} = \frac{a \cdot (a+1)}{a \cdot (x-y)} = \frac{\cancel{a} \cdot (a+1)}{\cancel{a} \cdot (x-y)} = \frac{a+1}{x-y}$$

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

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

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

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.)

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

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



Zadatke riješio Mladen – Sraga - 1992.g.

Zadaci su uzeti iz zbirke zadataka : Matematika 1 – autora Pavković – Veljan
 isti zadaci nalaze se u zbirci Mat-1- Kurnik-Pavković- Zorić (poglavlje -2.7. – zad: 86. i 87.)

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

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

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



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

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

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

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

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

Zadatke riješio Mladen – Sruga - 1992.g.

 Zadaci su uzeti iz zbirke zadataka : Matematika 1 – autora Pavković – Veljan
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$$29.) \frac{a^2 - 3ab + ac + 2bc}{a^2 - b^2 + 2bc - c^2} = \frac{a^2 - 2ab - ab + 2b^2 + ac - 2bc}{a^2(b^2 - 2bc + c^2)} = \frac{a(a-2b) - b(a-2b) + c(a-2b)}{a^2 - (b-c)^2} =$$

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

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

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

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

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

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

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

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

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

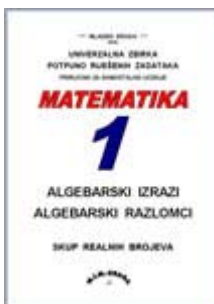
$$= \frac{3 \cdot (ax - b + 3a)}{ax \cdot (ax + b) \cdot (ax - b + 3a)} = \frac{3}{ax \cdot (ax + b)}$$



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

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

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



Univerzalna zbirka potpuno korak po korak riješenih zadataka
za prvi razred svih srednjih škola
Priručnik za samostalno učenje **MATEMATIKA-1-**
SKUPU REALNIH BROJEVA:



Više informacija o toj zbirci : www.mim-sraga.com

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Zadatke riješio Mladen – Sraga - 1992.g.
Zadaci su uzeti iz zbirke zadataka : Matematika 1 – autora Pavković – Veljan
isti zadaci nalaze se u zbirci Mat-1- Kurnik-Pavković- Zorić (poglavlje -2.7. – zad: 86. i 87.)



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