**** MLADEN SRAGA ****

POTPUNO RIJEŠENI ZADACI

PRIRUČNIK ZA SAMOSTALNO UČENJE

100 ELEMENTARNIH ZADATAKA

koje bi svatko trebao znati riješiti

I

ALGEBARSKI IZRAZI

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

$$(a+b)^2 = (b+a)^2$$

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

$$(a-b)^2 = (b-a)^2$$

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

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

$$(a+b)^3 = a^3+3a^2b+3ab^2+b^3$$

$$(a-b)^3 = a^3-3a^2b+3ab^2-b^3$$

$$a^3-b^3 = (a-b)\cdot(a^2+ab+b^2)$$

$$a^3+b^3 = (a+b)\cdot(a^2-ab+b^2)$$

$$(a+b+c)^2 = a^2+b^2+c^2+2ab+2ac+2bc$$

$$x^2+px+q = \left\{\begin{matrix} m+n=p \\ m\cdot n=q \end{matrix}\right\} = (x+m)\cdot(x+n)$$

$$ax^2+bx+c = \left\{\begin{matrix} m+n=b \\ m\cdot n=a\cdot c \end{matrix}\right\} = ax^2+mx+nx+c = \ldots$$

POTENCIJE

$$a^n\cdot a^m = a^{n+m}$$

$$a^n : a^m = a^{n-m}$$

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

$$(abc)^n = a^n b^n c^n$$

$$(a^n)^m = a^{n\cdot m}$$

$$\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}$$

$$\left(\frac{a}{b}\right)^{-n} = \left(\frac{b}{a}\right)^n = \frac{b^n}{a^n}$$

$$a^0 = 1$$

$$a^1 = a$$

$$a^{-1} = \frac{1}{a}$$

$$a^{-n} = \frac{1}{a^n}$$

M.I.M.-SRAGA

TEL. 01-4578-431

Autor:
MLADEN SRAGA

Grafička obrada
MLADEN SRAGA

Izdavač:
M.I.M.-Sraga d.o.o.
Centar za poduku
www.mim-sraga.com

Procijena i ocijena znanja ako se spremate :	
Za polaganje OSNOVNE razine	**Za polaganje VIŠE razine**
0 – 50 = 0	**0 – 50 = 0**
51 – 75 = 1	**51 – 81 = 1**
76 – 85 = 2	**82 – 86 = 2**
86 – 91 = 3	**87 – 90 = 3**
92 – 95 = 4	**91 – 94 = 4**
96 – 100 = 5	**95 – 100 = 5**

Moj komentar:

ako ste dobili ocjenu 0 - hitno tražite instruktora

ako ste dobili ocjenu 1 - trebali bi ozbiljno početi vježbati

ako ste dobili ocjenu 2 - Vi znate nešto ali ima tu puno rupa

ako ste dobili ocjenu 3 - dobro možete krenut na pripreme

ako ste dobili ocjenu 4 - vi ste spremni za OZBILJNIJE zadatke

ako ste dobili ocjenu 5 - odlično- vama osnovni zadaci na mature nebi trebali predstavljat problem

Prvo riješite zadatke pa tek onda gledajte u rješenja jer su tamo kompletno riješeni....

Potpunu garanciju na zadatke i rješenja daje: centar za dopisnu poduku M.I.M.-SRAGA -dakle sve što vam se čini nejasno krivo ili sumnjivo - zovite **01-4578-431** ili **01-4579-130** i tražite dodatne upute i objašnjenja ...

Zadatci su u potpunosti naš autorski rad , ako se neki zadatak već pojavio u nekoj drugoj zbirci ...nije namjerno ponovljen s naše strane.

Cijena ovih zadataka je 0 kn tj. besplatni su ...i tako treba i ostati...

Sve kritike i dobre i loše rado ćemo saslušati ...
javite nam se na tel. 01-4578-431 ili e-mailom : mim-sraga@zg.htnet.hr

Kompletna rješenja s postupkom

1) $x^2 \cdot x^3 = x^{2+3} = x^5$

2) $x^2 \cdot x^4 \cdot x^6 = x^{2+4+6} = x^{12}$

3) $x^{\frac{2}{3}} \cdot x^2 \cdot x^{\frac{5}{2}} = x^{\frac{2}{3}+2+\frac{5}{2}} = x^{\frac{2\cdot 2+2\cdot 6+5\cdot 3}{3\cdot 2}} = x^{\frac{31}{6}}$

4) $x^4 : x^2 = x^{4-2} = x^2$

5) $x^7 : x^2 : x^3 = x^{7-2-3} = x^2$

6) $x^7 \cdot x^8 : x^9 = x^{7+8-9} = x^6$

7) $\frac{x^8}{x^3} = x^8 : x^3 = x^{8-3} = x^5$

8) $\left(x^2\right)^3 = x^{2\cdot 3} = x^6$

9) $\left(\left(x^3\right)^4\right)^5 = x^{3\cdot 4\cdot 5} = x^{60}$

10) $\left(\left(x^2\right)^6\right)^2 \cdot \left(x^2\right)^5 = x^{2\cdot 6\cdot 2} \cdot x^{2\cdot 5} = x^{24} \cdot x^{10} = x^{24+10} = x^{34}$

11) $\left(\left(x^2\right)^5\right)^3 : \left(x^4\right)^5 = x^{2\cdot 5\cdot 3} : x^{4\cdot 5} = x^{30} : x^{20} = x^{30-20} = x^{10}$

12) $\left(2ab^2\right)^3 = 2^3 \cdot a^3 \cdot \left(b^2\right)^3 = 8 \cdot a^3 \cdot b^{2\cdot 3} = 8a^3b^6$

13) $\left(\frac{2}{3}x^2y^3\right)^4 = \frac{2^4}{3^4} \cdot \left(x^2\right)^4 \cdot \left(y^3\right)^4 = \frac{16}{81}x^8y^{12}$

14) $\left(\frac{2}{3}a^2b^3\right)^3 : \left(2ab^2\right)^2 = \frac{2^3}{3^3} \cdot \left(a^2\right)^3 \cdot \left(b^3\right)^3 : \left(2^2 \cdot a^2 \cdot \left(b^2\right)^2\right) = \frac{8}{27} \cdot a^6 \cdot b^9 : \left(4 \cdot a^2 \cdot b^4\right) =$

$$= \frac{8 \cdot a^6 \cdot b^9}{27} \cdot \frac{1}{4 \cdot a^2 \cdot b^4} = \frac{4 \cdot 2 \cdot a^2 \cdot a^4 \cdot b^4 \cdot b^5}{27} \cdot \frac{1}{4 \cdot a^2 \cdot b^4} = \frac{2 \cdot a^4 \cdot b^5}{27}$$

15) $\left(\frac{x}{y}\right)^{-1} = \frac{y}{x}$

16) $\left(\frac{x}{y}\right)^{-2} \cdot \left(\frac{y}{x}\right)^3 = \left(\frac{y}{x}\right)^2 \cdot \frac{y^3}{x^3} = \frac{y^2}{x^2} \cdot \frac{y^3}{x^3} = \frac{y^{2+3}}{x^{2+3}} = \frac{y^5}{x^5}$

17) $\left(\frac{a^2}{y^3}\right)^3 \cdot \left(\frac{y}{a^3}\right)^2 : \left(\frac{y^2}{a^4}\right)^2 = \frac{\left(a^2\right)^3}{\left(y^3\right)^3} \cdot \frac{y^2}{\left(a^3\right)^2} : \frac{\left(y^2\right)^2}{\left(a^4\right)^2} = \frac{a^6}{y^9} \cdot \frac{y^2}{a^6} : \frac{y^4}{a^8} = \frac{a^6}{y^9} \cdot \frac{y^2}{a^6} \cdot \frac{a^8}{y^4} =$

$$= \frac{y^2 \cdot a^8}{y^9 \cdot y^2 \cdot y^2} = \frac{a^8}{y^{9+2}} = \frac{a^8}{y^{11}}$$

18) $\left(\frac{2}{3}\right)^{-1} + \left(\frac{1}{3}\right)^{-2} - \left(\frac{1}{2}\right)^{-3} = \frac{3}{2} + \left(\frac{3}{1}\right)^2 - \left(\frac{2}{1}\right)^3 = \frac{3}{2} + 9 - 8 = \frac{3}{2} + 1 = \frac{3+2}{2} = \frac{5}{2}$

19) $27^0 \cdot x^0 \cdot y^0 \cdot 2^1 \cdot \left(\frac{1}{3}\right)^{-1} = 1 \cdot 1 \cdot 1 \cdot 2 \cdot \frac{3}{1} = 2 \cdot 3 = 6$

20) $y^0 \cdot 2^{-1} \cdot \left(\frac{1}{2}\right)^1 \cdot \left(\frac{1}{5}\right)^{-1} \cdot 2^{-3} = 1 \cdot \frac{1}{2} \cdot \frac{1}{2} \cdot \frac{5}{1} \cdot \frac{1}{2^3} = \frac{1 \cdot 5 \cdot 1}{2 \cdot 2 \cdot 8} = \frac{5}{32}$

21) $x^{\frac{1}{2}} = \sqrt{x}$

22) $x^{-\frac{1}{2}} = \frac{1}{x^{\frac{1}{2}}} = \frac{1}{\sqrt{x}}$

23) $x^{\frac{2}{3}} = x^{2\cdot\frac{1}{3}} = \left(x^2\right)^{\frac{1}{3}} = \sqrt[3]{x^2}$

24) $x^{-\frac{3}{4}} = \frac{1}{x^{\frac{3}{4}}} = \frac{1}{\left(x^3\right)^{\frac{1}{4}}} = \frac{1}{\sqrt[4]{x^3}}$

25) $36^{\frac{1}{2}} = \sqrt{36} = \sqrt{6^2} = 6$

26) $16^{\frac{1}{4}} = \sqrt[4]{16} = \sqrt[4]{2^4} = 2$

27) $\left(\frac{25}{49}\right)^{\frac{1}{2}} = \sqrt{\frac{25}{49}} = \frac{\sqrt{25}}{\sqrt{49}} = \frac{5}{7}$

28) $\left(\frac{16}{81}\right)^{\frac{1}{4}} = \sqrt[4]{\frac{16}{81}} = \sqrt[4]{\frac{2^4}{3^4}} = \sqrt[4]{\left(\frac{2}{3}\right)^4} = \frac{2}{3}$

29) $\left(\frac{64}{49}\right)^{-\frac{1}{2}} = \left(\frac{49}{64}\right)^{\frac{1}{2}} = \sqrt{\frac{49}{64}} = \frac{\sqrt{49}}{\sqrt{64}} = \frac{7}{8}$

30) $\left(\frac{9}{16}\right)^{-\frac{3}{2}} = \left(\frac{16}{9}\right)^{\frac{3}{2}} = \left(\frac{4^2}{3^2}\right)^{\frac{3}{2}} = \left(\left(\frac{4}{3}\right)^2\right)^{\frac{3}{2}} = \left(\frac{4}{3}\right)^{2\cdot\frac{3}{2}} = \left(\frac{4}{3}\right)^3 = \frac{4^3}{3^3} = \frac{64}{27}$

31) $\sqrt{10}\cdot\sqrt{10} = \sqrt{10\cdot 10} = \sqrt{10^2} = 10$

32) $\sqrt[3]{3}\cdot\sqrt[3]{9} = \sqrt[3]{3\cdot 9} = \sqrt[3]{27} = \sqrt[3]{3^3} = 3$

33) $\sqrt[4]{2}\cdot\sqrt[4]{8} = \sqrt[4]{2\cdot 8} = \sqrt[4]{16} = \sqrt[4]{2^4} = 2$

34) $\sqrt[5]{x^2}\cdot\sqrt[5]{x^3} = \sqrt[5]{x^2\cdot x^3} = \sqrt[5]{x^5} = x$

35) $\sqrt[6]{x^5} : \sqrt[6]{x} = \sqrt[6]{x^5 : x^2} = \sqrt[6]{x^{5-2}} = \sqrt[6]{x^3} = \sqrt[2\cdot 3]{x^3} = \sqrt[2]{x} = \sqrt{x}$

36) $(x+3)^2 = x^2 + 2\cdot x\cdot 3 + 3^2 = x^2 + 6x + 9$

37) $(2x+3y)^2 = (2x)^2 + 2\cdot 2x\cdot 3y + (3y)^2 = 2^2x^2 + 12xy + 3^2y^2 = 4x^2 + 12xy + 9y^2$

38) $(3x-4y)^2 = (3x)^2 - 2\cdot 3x\cdot 4y + (4y)^2 = 3^2x^2 - 24xy + 4^2y^2 = 9x^2 - 24xy + 16y^2$

39) $\left(\frac{1}{2}x + \frac{2}{3}y^3\right)^2 = \left(\frac{1}{2}x\right)^2 + 2\cdot\frac{1}{2}x\cdot\frac{2}{3}y^3 + \left(\frac{2}{3}y^3\right)^2 = \frac{1^2}{2^2}x^2 + \frac{2}{3}xy^3 + \frac{2^2}{3^2}\left(y^3\right)^2 = \frac{1}{4}x^2 + \frac{2}{3}xy^3 + \frac{4}{9}y^6$

40) $\left(\frac{2}{3}x^3 - \frac{3}{4}y^4\right)^2 = \left(\frac{2}{3}x^3\right)^2 - 2\cdot\frac{2}{3}x^3\cdot\frac{3}{4}y^4 + \left(\frac{3}{4}y^4\right)^2 = \frac{2^2}{3^2}\left(x^3\right)^2 - \frac{2\cdot 2\cdot 3}{3\cdot 4}\cdot x^3\cdot y^4 + \frac{3^2}{4^2}\left(x^3\right)^2 =$

$= \frac{4}{9}x^6 - x^3y^4 + \frac{9}{16}y^8$

41) $(5x-6y)^{-2} = \frac{1}{(5x-6y)^2} = \frac{1}{(5x)^2 - 2\cdot 5x\cdot 6y + (6y)^2} = \frac{1}{25x^2 - 60xy + 36y^2}$

42) $(-2a-3y)^2 = \left(-1\cdot(2a+3y)\right)^2 = (-1)^2\cdot(2a+3y)^2 = 1\cdot\left((2a)^2 + 2\cdot 2a\cdot 3y + (3y)^2\right) = 4a^2 + 12ay + 9y^2$

43) $(2x-5)\cdot(2x+5) = (2x)^2 - 5^2 = 2^2x^2 - 25 = 4x^2 - 25$

44) $\left(\frac{2}{3}x^2 - \frac{4}{5}y^3\right)\cdot\left(\frac{2}{3}x^2 + \frac{4}{5}y^3\right) = \left(\frac{2}{3}x^2\right)^2 - \left(\frac{4}{5}y^3\right)^2 = \frac{2^2}{3^2}\left(x^2\right)^2 - \frac{4^2}{5^2}\left(y^3\right)^2 = \frac{4}{9}x^4 - \frac{16}{25}y^6$

45) $\left(3x^2y^3z^4 - 4a^5b^6\right)\cdot\left(3x^2y^3z^4 - 4a^5b^6\right) = \left(3x^2y^3z^4\right)^2 - \left(4a^5b^6\right)^2 =$

$= 3^2\left(x^2\right)^2\left(y^3\right)^2\left(z^4\right)^2 - 4^2\left(a^5\right)^2\left(b^6\right)^2 = 9x^4y^6z^8 - 16a^{10}b^{12}$

46) $(x+3)^3 = x^3 + 3\cdot x^2\cdot 3 + 3\cdot x\cdot 3^2 + 3^3 = x^3 + 9x^2 + 3\cdot 9\cdot x + 27 = x^3 + 9x^2 + 27x + 27$

47) $(x+2)^2\cdot(x+2) = (x+2)^2\cdot(x+2)^1 = (x+2)^{2+1} = (x+2)^3 = x^3 + 3\cdot x^2\cdot 2 + 3\cdot x\cdot 2^2 + 2^3 = x^3 + 6x^2 + 12x + 8$

48) $(2y-3z)^3 = (2y)^3 - 3\cdot(2y)^2\cdot 3z + 3\cdot 2y\cdot(3z)^2 - (3z)^3 = 2^3y^3 - 9\cdot 2^2\cdot y^2\cdot z + 6\cdot y\cdot 3^2\cdot z^2 - 3^3z^3 =$

$= 8y^3 - 36y^2z + 54yz^2 - 27z^3$

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

$= \frac{1}{8} + \frac{1}{4}x + \frac{1}{6}x^2 + \frac{1}{27}x^3$

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

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

$= \frac{8}{27}x^6 - 2x^4y^3 + \frac{9}{2}x^2y^6 - \frac{27}{8}y^9$

51) $\left(3x^2y^3 - 2z^4\right)^3 = \left(3x^2y^3\right)^3 - 3\cdot\left(3x^2y^3\right)^2\cdot 2z^4 + 3\cdot 3x^2y^3\cdot\left(2z^4\right)^2 - \left(2z^4\right)^3 =$

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

$= 27x^6y^9 - 54x^4y^6 + 36x^2y^3z^8 - 8z^{12}$

52) $(x+y)^3 - (x-y)^3 = x^3 + 3x^2y + 3xy^2 + y^3 - \left(x^3 - 3x^2y + 3xy^2 - y^3\right) =$

$= x^3 + 3x^2y + 3xy^2 + y^3 - x^3 + 3x^2y - 3xy^2 + y^3 = 6x^2y + 2y^3$

Primjer:

$27x^3-8y^6=?$

rješenje:

$$27x^3-8y^6=3^3x^3-2^3\left(y^2\right)^3=(3x)^3-\left(2y^2\right)^3=\left(3x-2y^2\right)\cdot\left((3x)^2+3x\cdot 2y^2+\left(2y^2\right)^2\right)=$$

$$\begin{array}{ccc} \downarrow & \downarrow & \\ a^3 & - \; b^3 & =\left(a-b\right)\cdot\left(a^2+a\cdot b+b^2\right) \\ \downarrow & \downarrow & \\ a^3=(3x)^3 & b^3=\left(2y^2\right)^3 & \\ a=3x & b=2y^2 & \end{array}$$

$$=\left(3x-2y^2\right)\cdot\left(9x^2+6xy^2+4y^4\right)$$

Koristi gornji primjer i ove formule riješi sljedeće zadatke:

ALGEBARSKI IZRAZI
$a^3-b^3=(a-b)\cdot\left(a^2+ab+b^2\right)$
$a^3+b^3=(a+b)\cdot\left(a^2-ab+b^2\right)$

Rastavi na faktore:

53) $x^3-8=x^3+2^3=\left|A=x,\ B=2\right|=(x+2)\cdot\left(x^2-2\cdot x+2^2\right)=(x+2)\cdot(x^2-2x+4)$

54) $8y^3-27=2^3y^3-3^3=(2y)^3-3^3=(2y-3)\cdot\left((2y)^2+2y\cdot 3+3^2\right)=$
$=(2y-3)\cdot(4y^2+6y+9)$

55) $x^6+125=(x^2)^3+5^3=(x^2+5)\cdot\left((x^2)^2-x^2\cdot 5+5^2\right)=$
$=(x^2+5)\cdot(x^4-5x^2+25)$

56) $x^6-y^6=(x^2)^3-(y^2)^3=(x^2-y^2)\cdot\left((x^2)^2+x^2\cdot y^2+(y^2)^2\right)=$
$=(x-y)(x+y)\cdot(x^4+x^2y^2+y^4)$

57) $\frac{1}{27}y^3+1=\frac{1^3}{3^3}y^3+1^3=\left(\frac{1}{3}y\right)^3+1^3=\left(\frac{1}{3}y+1\right)\cdot\left(\left(\frac{1}{3}y\right)^2-\frac{1}{3}y\cdot 1+1^2\right)=$
$=\left(\frac{1}{3}y+1\right)\cdot\left(\frac{1}{9}y^2-\frac{1}{3}y+1\right)$

58) $64x^9y^6+125z^3=4^3(x^3)^3(y^2)^3+5^3z^3=$
$=(4x^3y^2)^3+(5z)^3=(4x^3y^2+5z)\left((4x^3y^2)^2-4x^3y^2\cdot 5z+(5z)^2\right)=$
$=(4x^3y^2+5z)\left(16x^6y^4-20x^3y^2z+25z^2\right)$

Koristeći se formulom riješi sljedeće zadatke:

$$(a+b+c)^2 = a^2+b^2+c^2+2ab+2ac+2bc$$

59) $(x+2y+3)^2 = x^2+(2y)^2+3^2+2\cdot x\cdot 2y+2\cdot x\cdot 3+2\cdot 2y\cdot 3 =$
$= x^2+4y^2+9+4xy+6x+12y$

(a = x, b = 2y, c = 3)

60) $(2x+3y+4z)^2 = (2x)^2+(3y)^2+(4z)^2+2\cdot 2x\cdot 3y+2\cdot 2x\cdot 4z+2\cdot 3y\cdot 4z =$
$= 4x^2+9y^2+16z^2+12xy+16xz+24yz$

61) $(3x+y-3)^2 = (3x+y+(-3))^2 = (3x)^2+y^2+(-3)^2+2\cdot 3x\cdot y+2\cdot 3x\cdot(-3)+2\cdot y\cdot(-3) =$
$= 9x^2+y^2+9+6xy-18x-6y$

(a = 3x, b = y, c = −3)

Koristeći se formulom: $a^2-b^2=(a-b)\cdot(a+b)$

rastavi na faktore:

62) $x^2-16 = x^2-4^2 = (x-4)(x+4)$

63) $4y^2-36x^2 = 2^2y^2-6^2x^2 = (2y)^2-(6x)^2 = (2y-6x)(2y+6x) =$
$= 2\cdot(y-3x)\cdot 2\cdot(y+3x) = 4\cdot(y-3x)\cdot(y+3x)$

ILI OVAKO $= 4\cdot(y^2-9x^2) = 4\cdot(y-3x)(y+3x)$

64) $\frac{1}{4}x^4-\frac{25}{49}y^6 = \frac{1}{2^2}(x^2)^2-\frac{5^2}{7^2}(y^3)^2 =$
$= \left(\frac{1}{2}x^2\right)^2-\left(\frac{5}{7}y^3\right)^2 = \left(\frac{1}{2}x^2-\frac{5}{7}y^3\right)\left(\frac{1}{2}x^2+\frac{5}{7}y^3\right)$

65) $x^4-y^4 = (x^2)^2-(y^2)^2 = (x^2-y^2)\cdot(x^2+y^2) = (x-y)(x+y)\cdot(x^2+y^2)$

(još jednom A^2-B^2)

66) $4x^2y^4-z^8 = 2^2x^2(y^2)^2-(z^4)^2 = (2xy^2)^2-(z^4)^2 =$
$= (2xy^2-z^4)(2xy^2+z^4)$

67) $(x+y)^2-(x-2y)^2 = (x+y-(x-2y))\cdot(x+y+(x-2y)) =$
$= (x+y-x+2y)\cdot(x+y+x-2y) = 3y\cdot(2x-y)$

(A^2, $A=x+y$; B^2, $B=x-2y$)

68) $36(x+y)^2-16(x-y)^2 = 6^2(x+y)^2-4^2(x-y)^2 = (6\cdot(x+y))^2-(4\cdot(x-y))^2 =$
$= (6x+6y)^2-(4x-4y)^2 =$
$= (6x+6y-(4x-4y))(6x+6y+(4x-4y)) =$
$= (6x+6y-4x+4y)(6x+6y+4x-4y) = (2x+10y)(10x+10y)$
$= 2\cdot(x+5y)\cdot 10\cdot(x+y) =$
$= 20(x+5y)\cdot(x+y)$

Koristeći se formulama:

$$a^2+2ab+b^2=(a+b)^2 \qquad a^2-2ab+b^2=(a-b)^2$$

slijedeće zadatke zapiši u obliku kvadrata binoma:

69) $9x^2+6y+y^2 = 3^2x^2+2\cdot 3\cdot y+y^2=(3x)^2+2\cdot 3\cdot y+y^2=(3x+y)^2$

$A^2+2\cdot A\cdot B+B^2$

70) $4x^2-20xy+25y^2 = 2^2x^2-2\cdot 2\cdot 5\cdot x\cdot y+5^2y^2=(2x)^2-2\cdot 2x\cdot 5y+(5y)^2=$

$A^2-2\cdot A\cdot B+B^2$

$=(2x-5y)^2$

71) $9x^6-12x^3y^4+4y^8 =$

$=3^2(x^3)^2-2\cdot 3\cdot 2\cdot x^3y^4+2^2(y^4)^2=(3x^3)^2-2\cdot 3x^3\cdot 2y^4+(2y^4)^2=(3x^3-2y^4)^2$

72) $x^4+y^6+2x^2y^3 = (x^2)^2+2\cdot x^2\cdot y^3+(y^3)^2=(x^2+y^3)^2$

$A^2 \quad 2\cdot A\cdot B \quad B^2$

73) $-x^2+2xy^4-y^8 = -1\cdot(x^2-2xy^4+(y^4)^2)=-1\cdot(x-y^4)^2$

$A^2-2\cdot A\cdot B \quad B^2$

74) $\frac{1}{4}a^2-3ab^2+9b^4 = \frac{1}{2^2}a^2-2\cdot\frac{1}{2}\cdot a\cdot 3b^2+3^2(b^2)^2=$

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

$A^2 \quad -2\cdot A\cdot B \quad B^2$

Kvadratni trinom

$$x^2+px+q=\begin{Bmatrix} m+n=p \\ m\cdot n=q \end{Bmatrix}=(x+m)\cdot(x+n)$$

$$ax^2+bx+c=\begin{Bmatrix} m+n=b \\ m\cdot n=a\cdot c \end{Bmatrix}=ax^2+mx+nx+c=\dots$$

Koristeći se gornjim formulama rastavi na faktore slijedeće kvadratne trinome:

75) $x^2+2x-15=\left|\begin{matrix} m+n=2 \\ m\cdot n=1\cdot(-15) \end{matrix}\right\} \begin{matrix} m+n=2 \\ m\cdot n=-15 \end{matrix} \Rightarrow \begin{matrix} m=5 \\ n=-3 \end{matrix}\Big| =$

$x^2+2x-15=x^2+5x-3x-15=x(x+5)-3\cdot(x+5)=(x+5)(x-3)$

76) $3x^2+x-2=\left|\begin{matrix} m+n=1 \\ m\cdot n=3\cdot(-2) \end{matrix}\right\} \begin{matrix} m+n=1 \\ m\cdot n=-6 \end{matrix} \Big\} \begin{matrix} m=3 \\ n=-2 \end{matrix}\Big| = 3x^2+3x-2x-2 =$

$=3x(x+1)-2\cdot(x+1)=$

$=(x+1)(3x-2)$

77) $x^2-x-12=\left|\begin{matrix} m+n=-1 \\ m\cdot n=1\cdot(-12) \end{matrix}\right\} \begin{matrix} m+n=-1 \\ m\cdot n=-12 \end{matrix} \Big\} \begin{matrix} m=-4 \\ n=3 \end{matrix}\Big| =$

$=x^2-4x+3x-12=x(x-4)+3\cdot(x-4)=(x-4)(x+3)$

Skrati razlomke koristeći sve što smo izvježbali do sada:

78) $\frac{4x-6y}{6x-9y} = \frac{2(2x-3y)}{3\cdot(2x-3y)} = \frac{2}{3}$

79) $\frac{x^2-y^2}{x^2+2xy+y^2} = \frac{(x-y)(x+y)}{(x+y)^2} = \frac{(x-y)(x+y)}{(x+y)(x+y)} = \frac{x-y}{x+y}$

80) $\frac{a^4-b^4}{a^2-2ab+b^2} = \frac{(a^2-b^2)(a^2+b^2)}{(a-b)^2} = \frac{(a-b)(a+b)(a^2+b^2)}{(a-b)(a-b)} = \frac{(a+b)(a^2+b^2)}{a-b}$

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

82) $\frac{(y+x)^2}{x^4-y^4} = \frac{(y+x)(y+x)}{(x^2-y^2)(x^2+y^2)} = \frac{(x+y)(x+y)}{(x-y)(x+y)(x^2+y^2)} = \frac{x+y}{(x-y)(x^2+y^2)}$

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

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

85) $\frac{3x^2+18x+27}{2x^2-18} = \frac{3\cdot(x^2+6x+9)}{2\cdot(x^2-9)} = \frac{3\cdot(x+3)^2}{2\cdot(x-3)(x+3)} = \frac{3\cdot(x+3)(x+3)}{2\cdot(x-3)(x+3)} = \frac{3\cdot(x+3)}{2\cdot(x-3)}$

86) $\frac{2x^2-xy-3y^2}{3x^2+6xy+3y^2} = \frac{2x^2+2xy-3xy-3y^2}{3\cdot(x^2+2xy+y^2)} = \frac{2x(x+y)-3y\cdot(x+y)}{3\cdot(x+y)^2} = \frac{(x+y)(2x-3y)}{3\cdot(x+y)(x+y)} = \frac{2x-3y}{3\cdot(x+y)}$

87) $\frac{x+3}{2}-\frac{x-2}{3}+\frac{x}{4}=\frac{2(x+3)-4(x-2)+x\cdot 3}{12}=\frac{2x+6-4x+8+3x}{12}=\frac{x+14}{12}$

87) $\frac{1}{x+2}-\frac{2}{x-2}=\frac{x-2-2(x+2)}{(x+2)(x-2)}=\frac{x-2-2x-4}{(x+2)(x-2)}=\frac{-x-6}{x^2-4}=\frac{-(x+6)}{-(4-x^2)}=\frac{x+6}{4-x^2}$

88) $\frac{2}{x-1}+\frac{3}{x+1}-\frac{3x-2}{x^2-1}=\frac{2}{x-1}+\frac{3}{x+1}-\frac{3x-2}{(x-1)(x+1)}=\frac{2(x+1)+3(x-1)-(3x-2)}{(x-1)(x+1)}=$

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

89) $\frac{1}{y-3}-\frac{1}{(y-3)^2}=\frac{y-3-1}{(y-3)^2}=\frac{y-4}{(y-3)^2}$

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

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

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

Izračunaj:

92) $\frac{x^2-y^2}{x^3-y^3}\cdot\frac{4x^2+4xy+4y^2}{(y+x)^2}=\frac{(x-y)(x+y)}{(x-y)(x^2+xy+y^2)}\cdot\frac{4(x^2+xy+y^2)}{(x+y)(x+y)}=\frac{4}{x+y}$

93) $\frac{x^4-y^4}{x^3+y^3}\cdot\frac{x^6+2x^3y^3+y^6}{x^4+x^2y^2}=\frac{(x^2-y^2)(x^2+y^2)}{x^3+y^3}\cdot\frac{(x^3)^2+2x^3y^3+(y^3)^2}{x^2(x^2+y^2)}$

$=\frac{(x-y)(x+y)}{x^3+y^3}\cdot\frac{(x^3+y^3)^2}{x^2}=\frac{(x-y)(x+y)\cdot(x^3+y^3)}{x^2}=$

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

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

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

95) $\dfrac{3x^2y+18xy+27y}{6x^2y-24y}:\dfrac{x^2-9}{x^2+4x+4}=\dfrac{3y(x^2+6x+9)}{6y(x^2-4)}\cdot\dfrac{x^2+4x+4}{x^2-9}=\dfrac{(x+3)^2}{2(x-2)(x+2)}\cdot\dfrac{(x+2)^2}{(x-3)(x+3)}=$

$=\dfrac{(x+3)(x+3)(x+2)(x+2)}{2(x-2)(x+2)(x-3)(x+3)}=\dfrac{(x+3)(x+2)}{2(x-2)(x-3)}$

96) $\dfrac{(x+y)^2-y^2}{(x-y)^2-z^2}:\dfrac{yx+2y^2}{xz-yz-z^2}=\dfrac{(x+y-y)(x+y+y)}{(x-y-z)(x-y+z)}:\dfrac{y(x+2y)}{z(x-y-z)}=\dfrac{x\cdot(x+2y)}{(x-y-z)(x-y+z)}\cdot\dfrac{z(x-y-z)}{y(x+2y)}=$

$=\dfrac{x\cdot z}{y(x-y+z)}$

97) $\left(\dfrac{1}{x-1}-\dfrac{1}{x+1}+\dfrac{3x-2}{x^2-1}\right)\cdot\dfrac{x^3+2x^2+x}{6x^2-9x}=\dfrac{x+1-(x-1)+3x-2}{(x-1)(x+1)}\cdot\dfrac{x(x^2+2x+1)}{3x(2x-3)}=$

$=\dfrac{x+1-x+1+3x-2}{(x-1)(x+1)}\cdot\dfrac{(x+1)^2}{3(2x-3)}=\dfrac{3x}{(x-1)(x+1)}\cdot\dfrac{(x+1)(x+1)}{3(2x-3)}$

$=\dfrac{x(x+1)}{(x-1)(2x-3)}$

98) $\dfrac{1+\dfrac{1}{y-1}}{1-\dfrac{1}{y+1}}=\dfrac{\dfrac{y-1+1}{y-1}}{\dfrac{y+1-1}{y+1}}=\dfrac{\dfrac{y}{y-1}}{\dfrac{y}{y+1}}=\dfrac{y(y+1)}{y(y-1)}=\dfrac{y+1}{y-1}$

99) $\dfrac{1-\dfrac{1+x}{1-2x}}{1+\dfrac{1+x}{1-2x}}=\dfrac{\dfrac{1-2x-(1+x)}{1-2x}}{\dfrac{1-2x+1+x}{1-2x}}=\dfrac{\dfrac{1-2x-1-x}{1-2x}}{\dfrac{2-x}{1-2x}}=\dfrac{1-2x-1-x}{2-x}=\dfrac{-3x}{2-x}=\dfrac{-3x}{-(x-2)}=\dfrac{3x}{x-2}$

100) $\dfrac{\dfrac{x-y}{x+y}-\dfrac{x+y}{x-y}}{\dfrac{4x^2y^3-4xy}{xy-x+y^2-y}}=\dfrac{\dfrac{(x-y)(x-y)-(x+y)(x+y)}{(x+y)(x-y)}}{\dfrac{4xy(xy^2-1)}{x(y-1)+y(y-1)}}=\dfrac{\dfrac{(x-y)^2-(x+y)^2}{(x+y)(x-y)}}{\dfrac{4xy(xy^2-1)}{(y-1)(x+y)}}=\dfrac{\dfrac{(x-y-(x+y))(x-y+x+y)}{(x+y)(x-y)}}{\dfrac{4xy(xy^2-1)}{(y-1)(x+y)}}=$

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

Ovo su uglavnom zadaci iz PRVOG razreda gimnazije oni će rijetko doći u ovom obliku, već su sastavni dio težih (složenijih) zadataka ali ako ih ne znate riješiti nećete znati riješiti ni zadatke kojih su oni dio…

Naš prijedlog provježbajte ih koristit će Vam !!!!!!

Moguće da je jedan zadatak krivo riješen ako ga pronađete javite nam: mim-sraga@zg.htnet.hr

Ako ne vidite dobro tekst od 15 do 20 strane zum namjestite na 150%

STO ELEMENTARNIH ZADATAKA

KOJE BI SVI TREBALI ZNATI RIJEŠITI

ako imaju namjeru položiti maturu !

Koristeći ove formule trebali bi riješiti zadane zadatke:

POTENCIJE

$$a^n \cdot a^m = a^{n+m}$$

$$a^n : a^m = a^{n-m}$$

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

$$(abc)^n = a^n b^n c^n$$

$$\left(a^n\right)^m = a^{n \cdot m}$$

$$\left(\left(a^n\right)^m\right)^z = a^{n \cdot m \cdot z}$$

$$\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}$$

$$\left(\frac{a}{b}\right)^{-n} = \left(\frac{b}{a}\right)^n = \frac{b^n}{a^n}$$

$$a^0 = 1$$

$$a^1 = a$$

$$a^{-1} = \frac{1}{a}$$

$$a^{-n} = \frac{1}{a^n}$$

$$a^{\frac{1}{n}} = \sqrt[n]{a}$$

$$a^{-\frac{1}{n}} = \frac{1}{a^{\frac{1}{n}}} = \frac{1}{\sqrt[n]{a}}$$

$$a^{\frac{m}{n}} = \sqrt[n]{a^m}$$

$$a^{-\frac{m}{n}} = \frac{1}{a^{\frac{m}{n}}} = \frac{1}{\sqrt[n]{a^m}}$$

1) $x^2 \cdot x^3 =$

2) $x^2 \cdot x^4 \cdot x^6 =$

3) $x^{\frac{2}{3}} \cdot x^2 \cdot x^{\frac{5}{2}} =$

4) $x^4 : x^2 =$

5) $x^7 : x^2 : x^3 =$

6) $x^7 \cdot x^8 : x^9 =$

7) $\frac{x^8}{x^3} =$

8) $\left(x^2\right)^3 =$

9) $\left(\left(x^3\right)^4\right)^5 =$

10) $\left(\left(x^2\right)^6\right)^2 \cdot \left(x^2\right)^5 =$

11) $\left(\left(x^2\right)^5\right)^3 : \left(x^4\right)^5 =$

12) $\left(2ab^2\right)^3 =$

13) $\left(\frac{2}{3}x^2y^3\right)^4 =$

14) $\left(\frac{2}{3}a^2b^3\right)^3 : \left(2ab^2\right)^2 =$

15) $\left(\frac{x}{y}\right)^{-1} =$

16) $\left(\frac{x}{y}\right)^{-2} \cdot \left(\frac{y}{x}\right)^3 =$

17) $\left(\frac{a^2}{y^3}\right)^3 \cdot \left(\frac{y}{a^3}\right)^2 : \left(\frac{y^2}{a^4}\right)^2 =$

18) $\left(\frac{2}{3}\right)^{-1} + \left(\frac{1}{3}\right)^{-2} - \left(\frac{1}{2}\right)^{-3} =$

19) $27^0 \cdot x^0 \cdot y^0 \cdot 2^1 \cdot \left(\frac{1}{3}\right)^{-1} =$

20) $y^0 \cdot 2^{-1} \cdot \left(\frac{1}{2}\right)^1 \cdot \left(\frac{1}{5}\right)^{-1} \cdot 2^{-3} =$

POTENCIJE

$$a^n \cdot a^m = a^{n+m}$$

$$a^n : a^m = a^{n-m}$$

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

$$(abc)^n = a^n b^n c^n$$

$$\left(a^n\right)^m = a^{n \cdot m}$$

$$\left(\left(a^n\right)^m\right)^z = a^{n \cdot m \cdot z}$$

$$\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}$$

$$\left(\frac{a}{b}\right)^{-n} = \left(\frac{b}{a}\right)^n = \frac{b^n}{a^n}$$

$$a^0 = 1$$

$$a^1 = a$$

$$a^{-1} = \frac{1}{a}$$

$$a^{-n} = \frac{1}{a^n}$$

$$a^{\frac{1}{n}} = \sqrt[n]{a}$$

$$a^{-\frac{1}{n}} = \frac{1}{a^{\frac{1}{n}}} = \frac{1}{\sqrt[n]{a}}$$

$$a^{\frac{m}{n}} = \sqrt[n]{a^m}$$

$$a^{-\frac{m}{n}} = \frac{1}{a^{\frac{m}{n}}} = \frac{1}{\sqrt[n]{a^m}}$$

KORIJENI

$$\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{a \cdot b}$$

$$\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{\frac{a}{b}}$$

21) $x^{\frac{1}{2}} =$

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

23) $x^{\frac{2}{3}} =$

24) $x^{-\frac{3}{4}} =$

25) $36^{\frac{1}{2}} =$

26) $16^{\frac{1}{4}} =$

27) $\left(\frac{25}{49}\right)^{\frac{1}{2}} =$

28) $\left(\frac{16}{81}\right)^{\frac{1}{4}} =$

29) $\left(\frac{64}{49}\right)^{-\frac{1}{2}} =$

30) $\left(\frac{9}{16}\right)^{-\frac{3}{2}} =$

31) $\sqrt{10} \cdot \sqrt{10} =$

32) $\sqrt[3]{3} \cdot \sqrt[3]{9} =$

33) $\sqrt[4]{2} \cdot \sqrt[4]{8} =$

34) $\sqrt[5]{x^2} \cdot \sqrt[5]{x^3} =$

35) $\sqrt[6]{x^5} : \sqrt[6]{x^2} =$

Koristeći formule koje smo upravo obradili i ove nove koje vam dajem ovdje riješite sljedeće zadatke:

36) $(x+3)^2 =$

37) $(2x+3y)^2 =$

38) $(3x-4y)^2 =$

39) $\left(\frac{1}{2}x+\frac{2}{3}y^3\right)^2 =$

40) $\left(\frac{2}{3}x^3-\frac{3}{4}y^4\right)^2 =$

41) $(5x-6y)^{-2} =$

42) $(-2a-3y)^2 =$

43) $(2x-5)\cdot(2x+5) =$

44) $\left(\frac{2}{3}x^2-\frac{4}{5}y^3\right)\cdot\left(\frac{2}{3}x^2+\frac{4}{5}y^3\right) =$

45) $\left(3x^2y^3z^4-4a^5b^6\right)\cdot\left(3x^2y^3z^4-4a^5b^6\right) =$

46) $(x+3)^3 =$

47) $(x+2)^2\cdot(x+2) =$

48) $(2y-3z)^3 =$

49) $\left(\frac{1}{2}+\frac{1}{3}x\right)^3 =$

50) $\left(\frac{2}{3}x^2-\frac{3}{2}y^3\right)^3 =$

51) $\left(3x^2y^3-2z^4\right)^3 =$

52) $(x+y)^3-(x-y)^3 =$

ALGEBARSKI IZRAZI

$$(a+b)^2 = (a+b)\cdot(a+b) = a^2+2ab+b^2$$
$$(a+b)^2 = (b+a)^2$$
$$(a-b)^2 = (a-b)\cdot(a-b) = a^2-2ab+b^2$$
$$(a-b)^2 = (b-a)^2$$
$$(-a-b)^2 = (a+b)^2$$
$$(a-b)\cdot(a+b) = a^2-b^2$$
$$(a+b)^3 = a^3+3a^2b+3ab^2+b^3$$
$$(a-b)^3 = a^3-3a^2b+3ab^2-b^3$$
$$a^3-b^3 = (a-b)\cdot(a^2+ab+b^2)$$
$$a^3+b^3 = (a+b)\cdot(a^2-ab+b^2)$$
$$(a+b+c)^2 = a^2+b^2+c^2+2ab+2ac+2bc$$

Primjer:

$27x^3 - 8y^6 = ?$

rješenje:

$$27x^3 - 8y^6 = 3^3 x^3 - 2^3 \left(y^2\right)^3 = (3x)^3 - \left(2y^2\right)^3 = \left(3x - 2y^2\right) \cdot \left((3x)^2 + 3x \cdot 2y^2 + \left(2y^2\right)^2\right) =$$

Prepoznaj: $a^3 - b^3 = (a-b) \cdot (a^2 + a \cdot b + b^2)$

$a^3 = (3x)^3 \quad b^3 = \left(2y^2\right)^3$

$a = 3x \quad b = 2y^2$

$$= \left(3x - 2y^2\right) \cdot \left(9x^2 + 6xy^2 + 4y^4\right)$$

Koristi gornji primjer i ove formule riješi sljedeće zadatke:

ALGEBARSKI IZRAZI

$$a^3 - b^3 = (a-b) \cdot (a^2 + ab + b^2)$$
$$a^3 + b^3 = (a+b) \cdot (a^2 - ab + b^2)$$

Rastavi na faktore:

53) $x^3 - 8 =$

54) $8y^3 - 27 =$

55) $x^6 + 125 =$

56) $x^6 - y^6 =$

57) $\frac{1}{27} y^3 + 1 =$

58) $64x^9 y^6 + 125 z^3 =$

Koristeći se formulom
riješi sljedeće zadatke:

$$\boxed{(a+b+c)^2 = a^2+b^2+c^2+2ab+2ac+2bc}$$

59) $(x+2y+3)^2 =$

60) $(2x+3y+4z)^2 =$

61) $(3x+y-3)^2 =$

Koristeći se formulom:

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

rastavi na faktore:

62) $x^2-16 =$

63) $4y^2-36x^2 =$

64) $\frac{1}{4}x^4-\frac{25}{49}y^6 =$

65) $x^4-y^4 =$

66) $4x^2y^4-z^8 =$

67) $(x+y)^2-(x-2y)^2 =$

68) $36(x+y^2)-16(x-y)^2 =$

Koristeći se formulama:

$$a^2+2ab+b^2=(a+b)^2 \qquad a^2-2ab+b^2=(a-b)^2$$

slijedeće zadatke zapiši u obliku kvadrata binoma:

69) $9x^2+6y+y^2=$

70) $4x^2-20xy+25y^2=$

71) $9x^6-12x^3y^4+4y^8=$

72) $x^4+y^6+2x^2y^3=$

73) $-x^2+2xy^4-y^8=$

74) $\frac{1}{4}a^2-3ab^2+9b^4=$

Kvadratni trinom

$$x^2+px+q=\left\{\begin{matrix} m+n=p \\ m\cdot n=q \end{matrix}\right\}=(x+m)\cdot(x+n)$$

$$ax^2+bx+c=\left\{\begin{matrix} m+n=b \\ m\cdot n=a\cdot c \end{matrix}\right\}=ax^2+mx+nx+c=\ldots$$

Koristeći se gornjim formulama rastavi na faktore slijedeće kvadratne trinome:

75) $x^2+2x-15=$

76) $3x^2+x-2=$

77) $x^2-x-12=$

Skrati razlomke koristeći sve što smo izvježbali do sada:

78) $\dfrac{4x-6y}{6x-9y}=$

79) $\dfrac{x^2-y^2}{x^2+2xy+y^2}=$

80) $\dfrac{a^4-b^4}{a^2-2ab+b^2}=$

81) $\dfrac{(x-y)^2}{y^2-x^2}=$

Pogledaj u formule za ove brojnike u 81) i 82)

82) $\dfrac{(y+x)^2}{x^4-y^4}=$

83) $\dfrac{x^3-y^3}{3x^2-3y^2}=$

84) $\dfrac{x^3+y^3}{(x+y)^3}=$

85) $\dfrac{3x^2+18x+27}{2x^2-18}=$

86) $\dfrac{2x^2-xy+3y^2}{3x^2+6xy+3y^2}=$

87) $\frac{x+3}{2}-\frac{x-2}{3}+\frac{x}{4}=$

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

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

89) $\frac{1}{y-3}-\frac{1}{(y-3)^2}=$

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

91) $\frac{y}{x^2-y^2}-\frac{y}{(y-x)^2}=$

Izračunaj:

92) $\frac{x^2-y^2}{x^3-y^3}\cdot\frac{4x^2+4xy+4y^2}{(y+x)^2}=$

93) $\frac{x^4-y^4}{x^3+y^3}\cdot\frac{x^6+2x^3y^3+y^6}{x^4+x^2y^2}=$

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

95) $\dfrac{3x^2y+18xy+27y}{6x^2y-24y}:\dfrac{x^2-9}{x^2+4x+4}=$

96) $\dfrac{(x+y)^2-y^2}{(x-y)^2-z^2}:\dfrac{yx+2y^2}{xz-yz-z^2}=$

97) $\left(\dfrac{1}{x-1}-\dfrac{1}{x+1}+\dfrac{3x-2}{x^2-1}\right)\cdot\dfrac{x^3+2x^2+x}{6x^2-9x}=$

98) $\dfrac{1+\dfrac{1}{y-1}}{1-\dfrac{1}{y+1}}=$

99) $\dfrac{1-\dfrac{1+x}{1-2x}}{1+\dfrac{1+x}{1-2x}}=$

100) $\dfrac{\dfrac{x-y}{x+y}-\dfrac{x+y}{x-y}}{\dfrac{4x^2y^3-4xy}{xy-x+y^2-y}}=$