

Rješenja svih zadataka s kompletnim postupkom i uputama

1. Koristimo pravila:
$$a \cdot a = a^2, \quad a \cdot a \cdot a = a^3, \quad \underbrace{a \cdot a \cdot a \cdot \dots \cdot a}_{n\text{-puta}} = a^n$$

Uputa: Prebrojite koliko se puta ponavlja isti faktor i taj broj stavite u eksponent:

1) $\underbrace{2 \cdot 2 \cdot 2 \cdot 2 \cdot 2}_{\substack{2\text{-se ponavlja pet} \\ \text{puta pa u eksponent} \\ \text{pišemo 5}}} = 2^5 \quad \rightarrow \text{čitamo: dva na petu}$

1) $2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 = 2^5$

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

3) $x \cdot y \cdot x \cdot y \cdot x \cdot z \cdot x \cdot y \cdot x \cdot x \cdot z = x \cdot x \cdot x \cdot x \cdot x \cdot x \cdot y \cdot y \cdot y \cdot z \cdot z = x^6 \cdot y^3 \cdot z^2 = x^6 y^3 z^2$
grupiramo iste faktore...

4) $(xy) \cdot (xy) \cdot (xy) = (xy)^3$

5) $(x+y) \cdot (x+y) \cdot (x+y) \cdot (x+y) = (x+y)^4$

6) $\left(\frac{x}{y}\right) \cdot \left(\frac{x}{y}\right) \cdot \left(\frac{x}{y}\right) \cdot \left(\frac{x}{y}\right) = \left(\frac{x}{y}\right)^4$

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

8) $\left(\frac{a-b}{c}\right) \cdot \left(\frac{a-b}{c}\right) \cdot \left(\frac{a-b}{c}\right) = \left(\frac{a-b}{c}\right)^3$

2. Koristimo pravila:
$$a^2 = a \cdot a, \quad a^3 = a \cdot a \cdot a, \quad a^n = \underbrace{a \cdot a \cdot a \cdot \dots \cdot a}_{n\text{-puta}}$$

1) $5^2 = 5 \cdot 5 = 25$

2) $2^3 = 2 \cdot 2 \cdot 2 = 8$

3) $3^4 = 3 \cdot 3 \cdot 3 \cdot 3 = 81$

4) $(-1)^2 = (-1) \cdot (-1) = 1$
5) $(-1)^3 = (-1) \cdot (-1) \cdot (-1) = -1$
6) $(-1)^4 = (-1) \cdot (-1) \cdot (-1) \cdot (-1) = 1$ } Zaključak: $(-1)^{\text{na parni eksponent}} = 1$
 $(-1)^{\text{na neparni eksponent}} = -1$

7) $(-2)^3 = \underbrace{(-2) \cdot (-2) \cdot (-2)}_{\downarrow} = -8$

Imamo neparan broj "minusa" pa će i umnožak biti negativno tj. imati će predznak minus

8) $(-x)^4 = \underbrace{(-x) \cdot (-x) \cdot (-x) \cdot (-x)}_{\substack{\text{Imamo paran broj "minusa" pa} \\ \text{je produkt pozitivan broj}}} = x^4$

2. Koristimo pravila:

$$a^2 = a \cdot a, \quad a^3 = a \cdot a \cdot a, \quad a^n = \underbrace{a \cdot a \cdot a \cdot \dots \cdot a}_{n\text{-puta}}$$

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

$$10) \left(\frac{3}{5}\right)^3 = \frac{3}{5} \cdot \frac{3}{5} \cdot \frac{3}{5} = \frac{27}{125}$$

$$11) \left(\frac{2}{3}\right)^5 = \frac{2}{3} \cdot \frac{2}{3} \cdot \frac{2}{3} \cdot \frac{2}{3} \cdot \frac{2}{3} = \frac{32}{243}$$

$$12) \left(-\frac{2}{3}\right)^2 = \left(-\frac{2}{3}\right) \cdot \left(-\frac{2}{3}\right) = \frac{2 \cdot 2}{3 \cdot 3} = \frac{4}{9}$$

$$13) \left(-\frac{2}{3}\right)^3 = \left(-\frac{2}{3}\right) \cdot \left(-\frac{2}{3}\right) \cdot \left(-\frac{2}{3}\right) = -\frac{2 \cdot 2 \cdot 2}{3 \cdot 3 \cdot 3} = -\frac{8}{27}$$

$$14) \left(\frac{3}{4}\right)^4 = \frac{3}{4} \cdot \frac{3}{4} \cdot \frac{3}{4} \cdot \frac{3}{4} = \frac{81}{256}$$

$$15) \left(-\frac{4}{5}\right)^2 = \left(-\frac{4}{5}\right) \cdot \left(-\frac{4}{5}\right) = +\frac{4 \cdot 4}{5 \cdot 5} = \frac{16}{25}$$

$$16) \left(-\frac{4}{5}\right)^3 = \left(-\frac{4}{5}\right) \cdot \left(-\frac{4}{5}\right) \cdot \left(-\frac{4}{5}\right) = -\frac{4 \cdot 4 \cdot 4}{5 \cdot 5 \cdot 5} = -\frac{64}{125}$$

$$17) \left(-\frac{4}{5}\right)^4 = \left(-\frac{4}{5}\right) \cdot \left(-\frac{4}{5}\right) \cdot \left(-\frac{4}{5}\right) \cdot \left(-\frac{4}{5}\right) = +\frac{4 \cdot 4 \cdot 4 \cdot 4}{5 \cdot 5 \cdot 5 \cdot 5} = \frac{256}{625}$$

$$18) 0,2^2 = 0,2 \cdot 0,2 = 0,04$$

$$19) (-0,2)^2 = (-0,2) \cdot (-0,2) = +0,2 \cdot 0,2 = 0,04$$

$$20) 0,2^3 = 0,2 \cdot 0,2 \cdot 0,2 = 0,04 \cdot 0,2 = 0,008$$

$$21) (-0,2)^3 = (-0,2) \cdot (-0,2) \cdot (-0,2) = -(0,2 \cdot 0,2 \cdot 0,2) = -0,008$$

$$22) (-2,5)^2 = (-2,5) \cdot (-2,5) = +(2,5 \cdot 2,5) = 6,25$$

2. Koristimo pravila:

$$a^2 = a \cdot a, \quad a^3 = a \cdot a \cdot a, \quad a^n = \underbrace{a \cdot a \cdot a \cdot \dots \cdot a}_{n\text{-puta}}$$

$$23) \quad (-2,5)^3 = (-2,5) \cdot (-2,5) \cdot (-2,5) = -(2,5 \cdot 2,5 \cdot 2,5) = 15,625$$

$$24) \quad (-2,5)^4 = (-2,5) \cdot (-2,5) \cdot (-2,5) \cdot (-2,5) = +(2,5 \cdot 2,5 \cdot 2,5 \cdot 2,5) = 39,0625$$

$$25) \quad (-1)^2 + (-1)^3 + (-1)^4 + (-1)^5 = +1 \cdot (-1) \cdot (+1) \cdot (-1) = +1 = 1$$

Prebrojimo minuse -ima
ih paran broj pa će umnožak
biti pozitivan broj

$$26) \quad (-1)^{20} + (-1)^{30} + (-1)^{45} = +1 \cdot (+1) \cdot (-1) = -1$$

$$27) \quad (-2)^1 + (-2)^2 + (-2)^3 + (-2)^4 = -2 + 4 - 8 + 16 = 4 + 16 - 2 - 8 = 10$$

$$28) \quad 2^5 - 3^2 = 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 - 3 \cdot 3 = 32 - 9 = 23$$

$$29) \quad 3^4 - 2^5 = 3 \cdot 3 \cdot 3 \cdot 3 - 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 = 81 - 32 = 49$$

$$30) \quad (-2)^3 + (-2)^5 = (-2) \cdot (-2) \cdot (-2) + (-2) \cdot (-2) \cdot (-2) \cdot (-2) \cdot (-2) = -8 - 32 = -40$$

$$31) \quad \left(\frac{1}{4}\right)^2 + \left(-\frac{1}{2}\right)^3 = \frac{1}{4} \cdot \frac{1}{4} + \left(-\frac{1}{2}\right) \cdot \left(-\frac{1}{2}\right) \cdot \left(-\frac{1}{2}\right) = \frac{1}{16} - \frac{1}{8} = \frac{1-2}{16} = -\frac{1}{16}$$

$$32) \quad [(-0,2)^2 + (-0,2)^3]^2 = [(-0,2) \cdot (-0,2) + (-0,2) \cdot (-0,2) \cdot (-0,2)]^2 = \\ = (0,04 - 0,008)^2 = 0,032^2 = 0,001024$$

3. Koristimo pravila:

$c \cdot a + d \cdot a = (c + d) \cdot a$	$c \cdot a - d \cdot a = (c - d) \cdot a$
$c \cdot a^n + d \cdot a^n = (c + d) \cdot a^n$	$c \cdot a^n - d \cdot a^n = (c - d) \cdot a^n$

$$1) \quad 2x + 3x = (2 + 3) \cdot x = 5 \cdot x = 5x$$

$\left. \begin{array}{l} 5 \cdot x \\ \text{ili} \\ 5x \end{array} \right\}$ je potpuno isti izraz...

$$2) \quad x + 2x + 4x = (1 + 2 + 4) \cdot x = 7x$$

ili taj isti zadatak na malo duži ali sigurniji način:

$$x + 2x + 4x = 1x + 2x + 4x = (1 + 2 + 4) \cdot x = 7x \quad \text{Dakle: } x = 1x$$

Praksa je pokazala da velika većina đaka radi istu grešku: uzimate da je: $x = 0x$ što nije točno!!

dakle vi kada računate u glavi grešite na ovaj način:

$$x + 2x + 4x = 6x \quad \text{ili} \quad x + 2x + 4x = (0 + 2 + 4) \cdot x = 6x \quad \text{što nije točno!!!}$$

Jednom zauvijek treba zapamtiti $x = 1x$ pa to u zadatku treba izgledati ovako:

$$x + 2x + 4x = 1x + 2x + 4x = (1 + 2 + 4) \cdot x = 7x$$

$$3) \quad 7a - 2a = (7 - 2) \cdot a = 5 \cdot a = 5a$$

$$4) \quad 9y - 2y + 3y - y = (9 - 2 + 3 - 1) \cdot y = 9 \cdot y = 9y$$

ili taj isti zadatak na malo duži ali sigurniji način:

$$9y - 2y + 3y - y = 9y - 2y + 3y - 1y = (9 - 2 + 3 - 1) \cdot y = 9y$$

$$5) \quad 2x + 3a - x + 5a + 7x - 2a =$$

$$= 2x - x + 7x + 3a + 5a - 2a = (2 - 1 + 7) \cdot x + (3 + 5 - 2) \cdot a = 8 \cdot x + 6 \cdot a = 8x + 6a$$

$$6) \quad 2xy + 3xy + xy = (2 + 3 + 1) \cdot xy = 6xy$$

$$7) \quad 2ab - 4ab + ab = (2 - 4 + 1) \cdot ab = -1 \cdot ab = -ab$$

$$8) \quad 4xy^2 + 2xy^2 - 9xy^2 = (4 + 2 - 9) \cdot xy^2 = -3 \cdot xy^2 = -3xy^2$$

$$9) \quad y + 3x^2y - 4z - 5x^2y - 2y + 8z - 3y + 8x^2y =$$

$$= y - 2y - 3y + 8z - 4z + 3x^2y - 5x^2y + 8x^2y =$$

$$= (1 - 2 - 3) \cdot y + (8 - 4) \cdot z + (3 - 5 + 8) \cdot x^2y =$$

$$= -4 \cdot y + 4 \cdot z + 6 \cdot x^2y =$$

$$= -4y + 4z + 6x^2y$$

$\left. \begin{array}{l} \\ \\ \\ \end{array} \right\}$ Ovo je potpuno isti izraz

3. Koristimo pravila:

$c \cdot a + d \cdot a = (c + d) \cdot a$	$c \cdot a - d \cdot a = (c - d) \cdot a$
$c \cdot a^n + d \cdot a^n = (c + d) \cdot a^n$	$c \cdot a^n - d \cdot a^n = (c - d) \cdot a^n$

$$10) \quad 7xy^3 - 2xy^3 + 4xy^3 = (7 - 2 + 4) \cdot xy^3 = 9 \cdot xy^3 = 9xy^3$$

$$11) \quad 2(x^2 - y) - 3(x^2 + y) = (2 - 3) \cdot (x^2 + y) = -1 \cdot (x^2 + y) = -x^2 - y$$

$$12) \quad 3(x + y) + 4(x + y) - (x + y) = (3 + 4 - 1) \cdot (x + y) = 6(x + y)$$

ili taj isti zadatak na malo duži ali sigurniji način:

$$\begin{aligned} 3(x + y) + 4(x + y) - (x + y) &= 3(x + y) + 4(x + y) - 1(x + y) = \\ &= (3 + 4 - 1) \cdot (x + y) = \\ &= 6(x + y) \end{aligned}$$

$$\begin{aligned} 13) \quad 5x^2y^3 + 2z - 2x^2y^3 + 7z + 3x^2y^3 - 3z &= \\ &= 5x^2y^3 - 2x^2y^3 + 3x^2y^3 + 2z + 7z = \\ &= (5 - 2 + 3) \cdot x^2y^3 + (2 + 7) \cdot z = \\ &= 6 \cdot x^2y^3 + 9 \cdot z = \\ &= 6x^2y^3 + 9z \end{aligned}$$

$$\begin{aligned} 14) \quad 3(x^2 - 3x + 5) - 4(x^2 - 5x + 1) &= \\ &= (3 - 4) \cdot (x^2 - 3x + 5) = \\ &= -1 \cdot (x^2 - 3x + 5) = \\ &= -x^2 + 3x - 5 \end{aligned}$$

$$15) \quad 3(x + y - 1) - 6(x + y - 1) + (x + y - 1) = (3 - 6 + 1) \cdot (x + y - 1) = -2(x + y - 1)$$

ili taj isti zadatak na malo duži ali sigurniji način:

$$\begin{aligned} 3(x + y - 1) - 6(x + y - 1) + (x + y - 1) &= 3(x + y - 1) - 6(x + y - 1) + 1(x + y - 1) = \\ &= (3 - 6 + 1) \cdot (x + y - 1) = \\ &= -2(x + y - 1) \end{aligned}$$

4. Koristimo pravila:

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

1) $2^5 \cdot 2^3 = 2^{5+3} = 2^8$

2) $5^2 \cdot 5^7 = 5^{2+7} = 5^9$

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

4) $7^{2m-5} \cdot 7^{m-2} = 7^{2m-5+m-2} = 7^{2m+m-5-2} = 7^{3m-7}$

5) $2^2 \cdot 2^6 \cdot 2^4 \cdot 2^8 = 2^{2+6+4+8} = 2^{20}$

6) $3 \cdot a^4 \cdot 2 \cdot a^7 = 3 \cdot 2 \cdot a^4 \cdot a^7 = 6 \cdot a^{4+7} = 6a^{11}$

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

8) $x \cdot x^3 \cdot x^5 = x^1 \cdot x^3 \cdot x^5 = x^{1+3+5} = x^9$

Pazi $x = x^1$

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

10) $x^{\frac{2}{3}} \cdot x^2 \cdot x^{\frac{5}{2}} = x^{\frac{2}{3}+2+\frac{5}{2}} = x^{\frac{2 \cdot 2+2 \cdot 6+5 \cdot 3}{6}} = x^{\frac{4+12+15}{6}} = x^{\frac{31}{6}}$

11) $x^2 \cdot x^{2+a} \cdot x^{a-2} \cdot x^3 = x^{2+2+a+a-2+3} = x^{a+a+2+2-2+3} = x^{2a+5}$

12) $a^3 \cdot a^6 = a^{3+6} = a^9$

13) $a^4 \cdot a^2 \cdot a = a^4 \cdot a^2 \cdot a^1 = a^{4+2+1} = a^7$ Pazi $a = a^1$

Dosta često radite ovakve greške:

$$\left. \begin{array}{l} a^4 \cdot a^2 \cdot a = a^{4+2} = a^6 \\ a^4 \cdot a^2 \cdot a = a^{4+2+0} = a^6 \end{array} \right\} \text{što nije točno jer je: } a = a^1$$

14) $a^2 \cdot a^5 \cdot a^7 \cdot a^3 = a^{2+5+7+3} = a^{17}$

15) $a^{3x} \cdot a^{x+2} \cdot a^{2x} = a^{3x+x+2+2x} = a^{6x+2}$

16) $a^{x+y} \cdot a^{2x} \cdot a^{x+3y} = a^{x+y+2x+x+3y} = a^{x+2x+x+y+3y} = a^{4x+4y}$

17) $-2 \cdot x \cdot 6 \cdot x^3 \cdot 3 \cdot x^4 = -2 \cdot 6 \cdot 3 \cdot x^1 \cdot x^3 \cdot x^4 = -36 \cdot x^{1+3+4} = -36x^8$

4. Koristimo pravila: $a^n \cdot a^m = a^{n+m}$ $a^n : a^m = a^{n-m}$ $\frac{a^n}{a^m} = a^n : a^m = a^{n-m}$

$$\begin{aligned}
 18) \quad & 2 \cdot x^2 \cdot x^5 + 3 \cdot x^2 \cdot y^3 \cdot x \cdot y - 4 \cdot x \cdot x^6 + 2 \cdot x^3 \cdot y^2 \cdot y^2 = \\
 & = 2 \cdot x^{2+5} + 3 \cdot x^2 \cdot x^1 \cdot y^3 \cdot y^1 - 4 \cdot x^1 \cdot x^6 + 2 \cdot x^3 \cdot y^{2+2} = \\
 & = 2 \cdot x^7 + 3 \cdot x^{2+1} \cdot y^{3+1} - 4 \cdot x^{1+6} + 2 \cdot x^3 \cdot y^4 = \\
 & = 2 \cdot x^7 - 4 \cdot x^7 + 3 \cdot x^3 \cdot y^4 + 2 \cdot x^3 \cdot y^4 = \\
 & = (2-4) \cdot x^7 + (3+2) \cdot x^3 \cdot y^4 = \\
 & = -2 \cdot x^7 + 5 \cdot x^3 \cdot y^4 = \left. \begin{array}{l} \\ \\ \\ \\ \end{array} \right\} \text{ To je potpuno isti izraz... uobičajeni zapis je ovaj zadnji...} \\
 & = -2x^7 + 5x^3y^4
 \end{aligned}$$

$$19) \quad \left(\frac{1}{2}\right)^2 \cdot \left(\frac{1}{2}\right)^3 \cdot \left(\frac{1}{2}\right)^4 = \left(\frac{1}{2}\right)^{2+3+4} = \left(\frac{1}{2}\right)^9$$

$$20) \quad x^{2m+1} \cdot x^{3m+2} = x^{2m+1+3m+2} = x^{2m+3m+1+2} = x^{5m+3}$$

$$21) \quad x^{2m-4} \cdot x^{3m+2} = x^{2m-4+3m+2} = x^{2m+3m+2-4} = x^{5m-2}$$

$$22) \quad x^{\frac{3}{2}m+1} \cdot x^{2m-7} = x^{\frac{3}{2}m+1+2m-7} = x^{\frac{3}{2}m+2m+1+8} = x^{\left(\frac{3}{2}+2\right) \cdot m+9} = x^{\frac{3+2 \cdot 2}{2} \cdot m+9} = x^{\frac{7}{2}m+9}$$

$$23) \quad x^{m+n} \cdot x^{2m-n} \cdot x^{3m+2n} = x^{m+n+2m-n+3m+2n} = x^{m+2m+3m+n-n+2n} = x^{6m+2n}$$

$$24) \quad x^{2m-n} \cdot x^{3m-n} \cdot x^{2m-2n} = x^{2m-n+3m-n+2m-2n} = x^{2m+3m+2m-n-n-2n} = x^{7m-4n}$$

$$25) \quad a^{2m+3n} \cdot a^{3m-5n} = a^{2m+3n+3m-5n} = a^{2m+3m+3n-5n} = a^{5m-2n}$$

$$26) \quad 2a^{m-3n+1} \cdot 3a^{4m+n-7} = 2 \cdot 3 \cdot a^{m-3n+1+4m+n-7} = 6 \cdot a^{m+4m+n-3n+1-7} = 6 \cdot a^{5m-2n-6} = 6a^{5m-2n-6}$$

$$27) \quad 2a^{x+y} \cdot 5a^{2x+y} = 2 \cdot 5 \cdot a^{x+y+2x+y} = 10 \cdot a^{x+2x+y+y} = 10a^{3x+2y}$$

$$28) \quad \frac{2}{3} a^{3m+2n} \cdot \frac{9}{4} a^{2m-4n} = \frac{2}{3} \cdot \frac{9}{4} \cdot a^{3m+2n} \cdot a^{2m-4n} = \frac{2}{3} \cdot \frac{3 \cdot 3}{2 \cdot 2} \cdot a^{3m+2n+2m-4n} = \frac{3}{2} \cdot a^{3m+2m+2n-4n} = \frac{3}{2} a^{5m-2n}$$

$$29) \quad (x-y)^2 \cdot (x-y) = (x-y)^2 \cdot (x-y)^1 = (x-y)^{2+1} = (x-y)^3$$

$$30) \quad (x+y)^3 \cdot (x+y)^4 = (x+y)^{3+4} = (x+y)^7$$

4. Koristimo pravila: $a^n \cdot a^m = a^{n+m}$ $a^n : a^m = a^{n-m}$ $\frac{a^n}{a^m} = a^n : a^m = a^{n-m}$

$$31) (x+y-1)^{m+1} \cdot (x+y-1)^{2m+2} \cdot (x+y-1)^{3m-4} = (x+y-1)^{m+1+2m+2+3m-4} = \\ = (x+y-1)^{m+2m+3m+1+2-4} = (x+y-1)^{6m-1}$$

$$32) (x^{2m} - y^n) \cdot (x^m + y^{2n}) = (x^m + y^{2n})^1 \cdot (x^m + y^{2n})^1 = (x^m + y^{2n})^{1+1} = (x^m + y^{2n})^2$$

$$33) (x+y)^2 \cdot (x-y)^3 \cdot (x+y)^{2m-1} \cdot (x-y)^{m-3} = (x+y)^2 \cdot (x+y)^{2m-1} \cdot (x-y)^3 \cdot (x-y)^{m-3} = \\ = (x+y)^{2+2m-1} \cdot (x-y)^{3+m-3} = \\ = (x+y)^{2m+2-1} \cdot (x-y)^{m+3-3} = \\ = (x+y)^{2m+1} \cdot (x-y)^m$$

$$34) \left(\frac{ab^2}{c}\right)^{3x-2y} \cdot \left(\frac{ab^2}{c}\right)^{4x-y} \cdot \left(\frac{ab^2}{c}\right)^{x-y} \cdot \left(\frac{ab^2}{c}\right)^{3y-2x} = \left(\frac{ab^2}{c}\right)^{3x-2y+4x-y+x-y+3y-2x} = \\ = \left(\frac{ab^2}{c}\right)^{3x+4x+x-2x-2y-y-y+3y} = \\ = \left(\frac{ab^2}{c}\right)^{6x-y}$$

$$35) 9x^4 y^2 \cdot \frac{1}{3} x^2 y = 9 \cdot \frac{1}{3} \cdot x^4 \cdot x^2 \cdot y^2 \cdot y^1 = 3 \cdot 3 \cdot \frac{1}{3} \cdot x^{4+2} \cdot y^{2+1} = 3 \cdot x^6 \cdot y^3 = 3x^6 y^3$$

$$36) 25x^6 y^4 \cdot \frac{yx^5}{5} = 5 \cdot 5 \cdot \frac{1}{5} \cdot x^6 \cdot y^4 \cdot y \cdot x^5 = 5 \cdot x^{6+5} \cdot y^{4+1} = 5x^{11} y^5$$

$$37) 2x^2 y^3 z^4 \cdot (-3x^3 y^4 z^2) = 2 \cdot (-3) \cdot x^2 \cdot x^3 \cdot y^3 \cdot y^4 \cdot z^4 \cdot z^2 = -6 \cdot x^{2+3} \cdot y^{3+4} \cdot z^{4+2} = -6x^5 y^7 z^6$$

$$38) x^2 \cdot (x^4 - x^3 - 3x^2 + 2x - 7) = x^2 \cdot x^4 - x^2 \cdot x^3 + x^2 \cdot (-3 \cdot x^2) + x^2 \cdot 2 \cdot x + x^2 \cdot (-7) = \\ = x^{2+4} - x^{2+3} - 3 \cdot x^{2+2} + 2 \cdot x^{2+1} - 7 \cdot x^2 = \\ = x^6 - x^5 - 3x^4 + 2x^3 - 7x^2$$

$$39) (-2xy^2) \cdot \left(x^2 y - \frac{1}{2} xy^3 + x^3 y\right) = -2xy^2 \cdot x^2 y + (-2xy^2) \cdot \left(-\frac{1}{2} xy^3\right) - 2xy^2 \cdot x^3 y = \\ = -2 \cdot x^1 \cdot x^2 \cdot y^2 \cdot y^1 + 2 \cdot \frac{1}{2} \cdot x^1 \cdot x^1 \cdot y^2 \cdot y^3 - 2 \cdot x^1 \cdot x^3 \cdot y^2 \cdot y^1 = \\ = -2 \cdot x^{1+2} \cdot y^{2+1} + x^{1+1} \cdot y^{2+3} - 2 \cdot x^{1+3} \cdot y^{2+1} = \\ = -2x^3 y^3 + x^2 y^5 - 2x^4 y^3$$

4. U slijedećim zadacima koristimo pravilo: $a^n : a^m = a^{n-m}$

$$40) 2^9 : 2^5 = 2^{9-5} = 2^4 = 2^4 = 2 \cdot 2 \cdot 2 \cdot 2 = 16$$

$$41) 13^7 : 13^5 = 13^{7-5} = 13^2 = 169$$

$$42) 3^{5x} : 3^{3x} = 3^{5x-3x} = 3^{2x}$$

$$43) 5^{3m-2} : 5^{m-2} = 5^{3m-2-(m-2)} = 5^{3m-2-m+2} = 5^{3m-m+2-2} = 5^{2m}$$

↓

Pazi: drugi eksponent se mora staviti u zagradu...vrlo često radite ovakvu grešku:

$$5^{3m-2} : 5^{m-2} = 5^{3m-2-m-2} = 5^{3m-m-2-2} = 5^{2m-4} \rightarrow \text{što nije točno!}$$

↓

Ovdje je pogreška u predznaku kod zadnjeg člana, jer prvom promjenite predznak, a drugom ne, to se događa zbog toga što radite napamet... tj. preskaćete korake...

Preporuka: čim imamo višečlane eksponente koristite zagrade i ne preskaćite korake...

$$44) x^4 : x^2 = x^{4-2} = x^2$$

$$45) x^6 : x^2 = x^{6-2} = x^4$$

$$46) x^7 : x^2 : x^3 = x^{7-2-3} = x^2$$

$$47) x^7 \cdot x^3 : x^4 = x^{7+3-4} = x^6$$

$$48) x : x^2 = x^1 : x^2 = x^{1-2} = x^{-1} = \frac{1}{x}$$

$$49) x^2 : x^{\frac{1}{2}} = x^{2-\frac{1}{2}} = x^{\frac{2 \cdot 2 - 1}{2}} = x^{\frac{4-1}{2}} = x^{\frac{3}{2}}$$

$$50) x^{\frac{7}{9}} : x^{\frac{1}{3}} = x^{\frac{7}{9}-\frac{1}{3}} = x^{\frac{7-1 \cdot 3}{9}} = x^{\frac{7-3}{9}} = x^{\frac{4}{9}}$$

$$51) x^{\frac{2}{5}} : x^2 : x^{\frac{1}{2}} = x^{\frac{2}{5}-2-\frac{1}{2}} = x^{\frac{2 \cdot 2 - 2 \cdot 10 - 1 \cdot 5}{10}} = x^{\frac{4-20-5}{10}} = x^{-\frac{21}{10}}$$

$$52) a^{4x} : a^{2x} = a^{4x-2x} = a^{2x}$$

$$53) a^8 : a^3 : a^2 = a^{8-3-2} = a^3$$

$$54) a : a^2 : a^3 = a^1 : a^2 : a^3 = a^{1-2-3} = a^{-4} \quad \text{ili} = \frac{1}{a^4}$$

$$55) a^7 : a^2 \cdot a^3 = a^{7-2+3} = a^8$$

U slijedećim zadacima koristimo pravilo: $\frac{a^n}{a^m} = a^n : a^m = a^{n-m}$

$$56) \frac{x^5}{x^2} = x^5 : x^2 = x^{5-2} = x^3$$

$$57) \frac{x^8}{x^3} = x^8 : x^3 = x^{8-3} = x^5$$

$$58) \frac{x^{\frac{3}{2}}}{x} = x^{\frac{3}{2}} : x^1 = x^{\frac{3}{2}-1} = x^{\frac{3-2}{2}} = x^{\frac{1}{2}}$$

$$59) \frac{x^{\frac{7}{4}}}{x^{\frac{1}{3}}} = x^{\frac{7}{4}} : x^{\frac{1}{3}} = x^{\frac{7}{4}-\frac{1}{3}} = x^{\frac{7 \cdot 3 - 1 \cdot 4}{12}} = x^{\frac{21-4}{12}} = x^{\frac{17}{12}}$$

4. U slijedećim zadacima koristimo pravilo:

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

$$60) \frac{x^{m+1}}{x^{2m+2}} = x^{m+1} : x^{2m+2} = x^{m+1-(2m+2)} = x^{m+1-2m-2} = x^{m-2m+1-2} = x^{-m-1}$$

$$61) \frac{x^{3m+7}}{x^{3m+5}} = x^{3m+7} : x^{3m+5} = x^{3m+7-(3m+5)} = x^{3m+7-3m-5} = x^{3m-3m+7-5} = x^2$$

$$62) \frac{x^{8m+7}}{x^{3m+2}} : x^{m-1} = x^{8m+7} : x^{3m+2} : x^{m-1} = x^{8m+7-(3m+2)-(m-1)} = x^{8m+7-3m-2-m+1} = x^{8m-3m-m+7-2+1} = x^{4m+6}$$

$$63) \frac{a^{9m+11}}{a^{2m-3}} : a^{7m+10} = a^{9m+11} : a^{2m-3} : a^{7m+10} = a^{9m+11-(2m-3)-(7m+10)} = a^{9m+11-2m+3-7m-10} = \\ = a^{9m-2m-7m+11+3-10} = a^4$$

$$64) (x-y)^7 : (x-y)^4 = (x-y)^{7-4} = (x-y)^3$$

$$65) (2x-3y)^{2x+3y} : (2x-3y)^{2x+3y} = (2x-3y)^{2x+3y-(2x+3y)} = (2x-3y)^{2x+3y-2x-3y} = (2x-3y)^0 = 1$$

$$66) \left(\frac{a^2b}{c^3}\right)^6 : \left(\frac{a^2b}{c^3}\right)^4 = \left(\frac{a^2b}{c^3}\right)^{6-4} = \left(\frac{a^2b}{c^3}\right)^2$$

$$67) (2x+y)^{2m-4} \cdot (2x+y)^{4m-2} : (2x+y)^{m-4} = (2x+y)^{2m-4+4m-2-(m-4)} = (2x+y)^{2m+4m-4-2-m+4} = \\ = (2x+y)^{2m+4m-m+4-4-2} = (2x+y)^{5m-2}$$

$$68) \left(\frac{a^2b}{c^3}\right)^{x-2} \cdot \left(\frac{a^2b}{c^3}\right)^{3x-3} : \left(\frac{a^2b}{c^3}\right)^{4x-4} = \left(\frac{a^2b}{c^3}\right)^{x-2+3x-3-(4x-4)} = \left(\frac{a^2b}{c^3}\right)^{x+3x-2-3-4x+4} = \\ = \left(\frac{a^2b}{c^3}\right)^{x+3x-4x+4-2-3} = \left(\frac{a^2b}{c^3}\right)^{-1} \quad \text{ili} \quad = \left(\frac{c^3}{a^2b}\right)$$

U ovom slučaju možete ostaviti i lijevo rješenje...
jer još nismo obradili pravilo: "na minus prvu"

↗ Množimo svaki član prve zagrade sa svakim članom druge zagrade...

$$69) (x^2 - 1) \cdot (x^4 + x^2 + 1) = x^2 \cdot x^4 + x^2 \cdot x^2 + x^2 \cdot 1 - 1 \cdot x^4 - 1 \cdot x^2 - 1 \cdot 1 = \\ = x^{2+4} + x^{2+2} + x^2 - x^4 - x^2 - 1 = \\ = x^6 + x^4 + x^2 - x^4 - x^2 - 1 = \\ = x^6 + x^4 - x^4 + x^2 - x^2 - 1 = \\ = x^6 - 1$$

$$70) (x^2 + 1) \cdot (x - x^2 + 1) = x^2 \cdot x^1 + x^2 \cdot (-x^2) + x^2 \cdot 1 + 1 \cdot x + 1 \cdot (-x^2) + 1 \cdot 1 = \\ = x^{2+1} - x^{2+2} + x^2 + x - x^2 + 1 = \\ = x^3 - x^4 + x^2 - x^2 + x + 1 = \\ = -x^4 + x^3 + x + 1$$

5. Koristimo pravila: $(ab)^n = a^n b^n$ $(abc)^n = a^n b^n c^n$ $(a^n)^m = a^{n \cdot m}$ $\left((a^n)^m\right)^z = a^{n \cdot m \cdot z}$

Pojavio nam se jedan problem a taj je: $(-x)^n$ vidi zadatke: 7),13),14),15),16),17),18),19),23),24)...

Pogledajmo opet u 2. zadatak kako smo to tamo riješili:

$$\left. \begin{array}{l} 2.4) (-1)^2 = (-1) \cdot (-1) = 1 \\ 5) (-1)^3 = (-1) \cdot (-1) \cdot (-1) = -1 \\ 6) (-1)^4 = (-1) \cdot (-1) \cdot (-1) \cdot (-1) = 1 \end{array} \right\} \text{ Zaključak: } \begin{array}{l} (-1)^{\text{na parni eksponent}} = 1 \\ (-1)^{\text{na neparni eksponent}} = -1 \end{array}$$

$$7) (-2)^3 = \underbrace{(-2) \cdot (-2) \cdot (-2)} = -8$$

Imamo neparan broj "minusa" pa će i umnožak biti negativno tj. imati će predznak minus

$$8) (-x)^4 = \underbrace{(-x) \cdot (-x) \cdot (-x) \cdot (-x)} = x^4$$

Imamo paran broj "minusa" pa je produkt pozitivan broj

Sada se javlja ovakav problem: $(-x)^{53} = \underbrace{(-x) \cdot (-x) \cdot \dots \cdot (-x)}_{53 \text{ puta bi to trebali napisati a to je previše pisanja pa ćemo rađe gledati eksponent}}$ = u eksponentu je 53 ,

53 je neparan broj pa je: $(-x)^{53} = -x^{53}$

dalje logički je pitanje koliko je $(-x)^{54}$? eksponent je 54, 54 je paran broj pa je: $(-x)^{54} = x^{54}$

$(-x)^{55} = -x^{55}$ jer je eksponent = 55, a 55 je neparan broj

$(-x)^{56} = x^{56}$ jer je eksponent = 56, a 56 je paran broj

Zaključak: $\left. \begin{array}{l} (-x)^{\text{na parni eksponent}} = x^{\text{parnu}} \\ (-x)^{\text{na neparni eksponent}} = -x^{\text{neparnu}} \end{array} \right\} \text{ ili } \begin{array}{l} (-x)^{2n} = x^{2n} \\ (-x)^{2n+1} = -x^{2n+1} \end{array}$

$$\begin{array}{l} 2n \text{ je oznaka za parni broj} \\ 2n + 1 \text{ je oznaka za neparan broj} \end{array}$$

Sada to primjenimo u zadatcima:

2.8) $(-x)^4 = x^4$ zato što je eksponent = 4, a 4 je paran broj

7) $(-2)^3 = -2^3 = -8$ zato što je eksponent = 3, a 3 je neparan broj

Postoji i drugi način rješavanja ovakvih zadataka:

II način

$$7) (-2)^3 = (-1 \cdot 2)^3 = (-1)^3 \cdot 2^3 = -1 \cdot 8 = -8$$

$$\underbrace{(-2)^3}_{\text{Svaki negativan broj } (-x) \text{ da se zapisati u obliku: } (-x) = (-1 \cdot x)}$$

Svaki negativan broj $(-x)$ da se zapisati u obliku: $(-x) = (-1 \cdot x)$

$$8) (-x)^4 = (-1 \cdot x)^4 = (-1)^4 \cdot x^4 = 1 \cdot x^4 = x^4 \quad \text{II način}$$

5. Koristimo pravila:

$$(ab)^n = a^n b^n \quad (abc)^n = a^n b^n c^n \quad (a^n)^m = a^{n \cdot m} \quad \left((a^n)^m \right)^z = a^{n \cdot m \cdot z}$$

$$(ab)^n = a^n b^n \quad \text{Postupili smo prema prvom pravilu...}$$

$$\updownarrow \quad \updownarrow$$

1) $(2x)^2 = 2^2 \cdot x^2 = 4 \cdot x^2 = 4x^2$

2) $(3x)^2 = 3^2 \cdot x^2 = 9 \cdot x^2 = 9x^2$

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

$$\updownarrow$$

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

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

Postupili smo prema drugom i trećem pravilu...

4) $\left(\frac{2}{3}xy^2\right)^3 = \left(\frac{2}{3}\right)^3 \cdot x^3 \cdot (y^2)^3 = \frac{2^3}{3^3} \cdot x^3 \cdot y^{2 \cdot 3} = \frac{8}{27}x^3y^6$

5) $\left(\frac{1}{2}x^2y^3\right)^4 = \left(\frac{1}{2}\right)^4 \cdot (x^2)^4 \cdot (y^3)^4 = \frac{1^4}{2^4} \cdot x^{2 \cdot 4} \cdot y^{3 \cdot 4} = \frac{1}{16}x^8y^{12}$

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

7) $(-x^2)^2 = (x^2)^2 = x^{2 \cdot 2} = x^4 \quad \text{I naćin}$

II naćin:

7) $(-x^2)^2 = (-1 \cdot x^2)^2 = (-1)^2 \cdot (x^2)^2 = 1 \cdot x^{2 \cdot 2} = x^4$

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

9) $(x^2)^5 = x^{2 \cdot 5} = x^{10}$

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

10) $(2x^3y^4)^2 = 2^2 \cdot (x^3)^2 \cdot (y^4)^2 = 4 \cdot x^{3 \cdot 2} \cdot y^{4 \cdot 2} = 4x^6y^8$

11) $(2x^3y^4)^3 = 2^3 \cdot (x^3)^3 \cdot (y^4)^3 = 8 \cdot x^{3 \cdot 3} \cdot y^{4 \cdot 3} = 8x^9y^{12}$

12) $(2x^3y^4)^4 = 2^4 \cdot (x^3)^4 \cdot (y^4)^4 = 16 \cdot x^{3 \cdot 4} \cdot y^{4 \cdot 4} = 16x^{12}y^{16}$

13) $\left[(-y)^2\right]^3 = (y^2)^3 = y^{2 \cdot 3} = y^6$

II naćin: 13) $\left[(-y)^2\right]^3 = \left[(-1 \cdot y)^2\right]^3 = \left[(-1)^2 \cdot y^2\right]^3 = \left[1 \cdot y^2\right]^3 = (y^2)^3 = y^{2 \cdot 3} = y^6$

5.

Koristimo pravilo:
$$\begin{array}{l} (-x)^{\text{na parni eksponent}} = x^{\text{parnu}} \\ (-x)^{\text{na neparni eksponent}} = -x^{\text{neparnu}} \end{array}$$
 prilikom računanja I načinom u 14), 15), 16), 17), 18), 19)...

$$14) \quad (-y^2)^3 = -(y^2)^3 = -y^{2 \cdot 3} = -y^6 \quad \text{to je bio I način rješavanja}$$

II način

$$14) \quad (-y^2)^3 = (-1 \cdot y^2)^3 = (-1)^3 \cdot (y^2)^3 = -1 \cdot y^{2 \cdot 3} = -1 \cdot y^6 = -y^6$$

↓

$$(-1)^3 = -1 \quad \text{Prema pravilu: } (-1)^{\text{neparnu}} = -1$$

$$(-1)^2 = +1 \quad \text{Prema pravilu: } (-1)^{\text{parnu}} = +1 = 1$$

↑

$$15) \quad (-y^3)^2 = (-1 \cdot y^3)^2 = (-1)^2 \cdot (y^3)^2 = 1 \cdot y^{3 \cdot 2} = 1 \cdot y^6 = y^6 \quad \text{to je bio II način rješavanja}$$

$$15) \quad (-y^3)^2 = (y^3)^2 = y^{3 \cdot 2} = y^6 \quad \text{to je bio I način rješavanja}$$

$$(-y^3)^{\text{parnu}} = (y^3)^{\text{parnu}}$$

$$16) \quad -(-y^4)^3 = -\left(-\left(y^4\right)^3\right) = -(-y^{4 \cdot 3}) = +y^{12} = y^{12} \quad \text{to je bio I način rješavanja}$$

$$16) \quad -(-y^4)^3 = -(-1 \cdot y^4)^3 = -\left[(-1)^3 \cdot (y^4)^3\right] = -(-1 \cdot y^{4 \cdot 3}) = -(-y^{12}) = y^{12} \quad \text{II način}$$

$$17) \quad -(-x^5)^2 = -(x^5)^2 = -x^{5 \cdot 2} = -x^{10} \quad \text{to je bio I način rješavanja}$$

$$17) \quad -(-x^5)^2 = -(-1 \cdot x^5)^2 = -\left[(-1)^2 \cdot (x^5)^2\right] = -(1 \cdot x^{5 \cdot 2}) = -(x^{10}) = -x^{10} \quad \text{II način}$$

U 18) pokazat ćemo tri načina rješavanja:

$$18) \quad \left[-(-x^5)\right]^2 = \left[+(-x^5)\right]^2 = (-x^5)^2 = (x^5)^2 = x^{5 \cdot 2} = x^{10} \quad \text{to je bio I način rješavanja}$$

$$18) \quad \left[-(-x^5)\right]^2 = \left[-1 \cdot (-x^5)\right]^2 = (-1^2) \cdot (-x^5)^2 = 1 \cdot (-1 \cdot x^5)^2 = (-1)^2 \cdot (x^5)^2 = 1 \cdot x^{5 \cdot 2} = x^{10} \quad \text{II način}$$

$$18) \quad \left[-(-x^5)\right]^2 = \left[+x^5\right]^2 = (x^5)^2 = x^{5 \cdot 2} = x^{10} \quad \text{III način ...u [] minus i minus daju plus}$$

U ovom 18) zadatku najbrži ne III način rješavanja... dok je u 19) definitivno II način najbolji....

5.

$$19) \left[-(-x^5)^2 \right]^2 = \left[+(-x^5)^2 \right]^2 = (-x^5)^{2 \cdot 2} = (-x^5)^4 = (x^5)^4 = x^{5 \cdot 4} = x^{20} \quad \text{I na\u0107in}$$

I na\u0107in u ovom zadatku pomalo zbunjuje pa je bolje to rje\u0161avati na II na\u0107in izlu\u0107ivanjem (-1):

II na\u0107in:

$$\begin{aligned} 19) \left[-(-x^5)^2 \right]^2 &= \left[-((-1) \cdot x^5)^2 \right]^2 = \left[-((-1)^2 \cdot (x^5)^2) \right]^2 = \\ &= \left[-(1 \cdot x^{5 \cdot 2}) \right]^2 = \\ &= \left[-1 \cdot x^{10} \right]^2 = \\ &= \left[(-1) \cdot x^{10} \right]^2 = (-1)^2 \cdot (x^{10})^2 = 1 \cdot x^{10 \cdot 2} = x^{20} \end{aligned}$$

$$20) -(x^5)^2 = -(x^{5 \cdot 2}) = -(x^{10}) = -x^{10}$$

$$21) (2ab^2)^3 = 2^3 \cdot a^3 \cdot (b^2)^3 = 8 \cdot a^3 \cdot b^{2 \cdot 3} = 8a^3b^6$$

$$22) (a^2b^3)^4 = (a^2)^4 \cdot (b^3)^4 = a^{2 \cdot 4} \cdot b^{3 \cdot 4} = a^8b^{12}$$

$$23) (-2y^3)^2 = (-2)^2 \cdot (y^3)^2 = 4 \cdot y^{3 \cdot 2} = 4y^6$$

↓

$$(-2)^2 = 4 \quad \text{jer je: } (-2)^2 = (-1 \cdot 2)^2 = (-1)^2 \cdot 2^2 = 1 \cdot 4 = 4$$

$$(-2)^3 = -8 \quad \text{jer je: } (-2)^3 = (-1 \cdot 2)^3 = (-1)^3 \cdot 2^3 = -1 \cdot 8 = -8$$

$$(-2)^4 = (-1 \cdot 2)^4 = (-1)^4 \cdot 2^4 = 1 \cdot 16 = 16 \quad \text{itd.}$$

$$\text{ili ovako: } (-2)^2 = (-2) \cdot (-2) = 4$$

$$(-2)^3 = (-2) \cdot (-2) \cdot (-2) = -8$$

ili koristimo pravilo:

$(-x)^{\text{na parni eksponent}} = x^{\text{parnu}}$
$(-x)^{\text{na neparni eksponent}} = -x^{\text{neparnu}}$

pa je: $(-2)^2 = 2^2 = 4$
 $(-2)^3 = -2^3 = -8$

$$(-3)^3 = -3^3 = -27$$

↑

$$24) (-3y^2)^3 = (-3)^3 \cdot (y^2)^3 = -3^3 \cdot y^{2 \cdot 3} = -27y^6$$

↓

$$(-3)^3 = (-1 \cdot 3)^3 = (-1)^3 \cdot 3^3 = -1 \cdot 27 = -27 \quad \text{ili } (-3)^3 = (-3) \cdot (-3) \cdot (-3) = -27$$

5.

$$\begin{array}{l}
 25) \left(-\frac{2}{3}x^2\right)^2 = \left(\frac{2}{3}x^2\right)^2 = \left(\frac{2}{3}\right)^2 \cdot (x^2)^2 = \frac{2^2}{3^2} \cdot x^{2 \cdot 2} = \frac{4}{9}x^4 \\
 25) \left(-\frac{2}{3}x^2\right)^2 = \left(-\frac{2}{3}\right)^2 \cdot (x^2)^2 = +\frac{2^2}{3^2} \cdot x^{2 \cdot 2} = \frac{4}{9}x^4 \\
 25) \left(-\frac{2}{3}x^2\right)^2 = \left(-1 \cdot \frac{2}{3} \cdot x^2\right)^2 = (-1)^2 \cdot \left(\frac{2}{3}\right)^2 \cdot (x^2)^2 = 1 \cdot \frac{2^2}{3^2} \cdot x^{2 \cdot 2} = \frac{4}{9}x^4
 \end{array}
 \left. \vphantom{\begin{array}{l} 25) \\ 25) \\ 25) \end{array}} \right\} 25) \text{ zadatak na tri načina}$$

$$26) \left(-\frac{2}{3}x^2\right)^3 = -\left(\frac{2}{3}x^2\right)^3 = -\left(\frac{2}{3}\right)^3 \cdot (x^2)^3 = -\frac{2^3}{3^3} \cdot x^{2 \cdot 3} = -\frac{8}{27}x^6 \quad \text{I način}$$

$$26) \left(-\frac{2}{3}x^2\right)^3 = \left(-\frac{2}{3}\right)^3 \cdot (x^2)^3 = -\frac{2^3}{3^3} \cdot x^{2 \cdot 3} = -\frac{8}{27}x^6 \quad \text{II način}$$

$$27) (x^m)^2 = x^{m \cdot 2} = x^{2m}$$

$$28) (y^n)^3 = y^{n \cdot 3} = y^{3n}$$

$$29) (x^m y^n)^4 = (x^m)^4 \cdot (y^n)^4 = x^{m \cdot 4} \cdot y^{n \cdot 4} = x^{4m} y^{4n}$$

$$30) (x^m y^n)^m = (x^m)^m \cdot (y^n)^m = x^{m \cdot m} \cdot y^{n \cdot m} = x^{m^2} y^{n \cdot m}$$

$$31) (a^{3x} b^{2y})^2 = (a^{3x})^2 \cdot (b^{2y})^2 = a^{3x \cdot 2} \cdot b^{2y \cdot 2} = a^{6x} b^{4y}$$

$$32) (a^{3x} b^{2y})^x = (a^{3x})^x \cdot (b^{2y})^x = a^{3x \cdot x} \cdot b^{2y \cdot x} = a^{3x^2} b^{2xy}$$

$$33) (2^x)^2 = 2^{x \cdot 2} = 2^{2 \cdot x} = (2^2)^x = 4^x$$

$$34) (3^x)^3 = 3^{x \cdot 3} = 3^{3 \cdot x} = (3^3)^x = 27^x$$

$$35) (2^x)^x = 2^{x \cdot x} = 2^{x^2}$$

$$36) (2^m 3^n)^2 = (2^m)^2 \cdot (3^n)^2 = 2^{m \cdot 2} \cdot 3^{n \cdot 2} = 2^{2 \cdot m} \cdot 3^{2 \cdot n} = (2^2)^m \cdot (3^2)^n = 4^m \cdot 9^n = 4^m 9^n$$

5.

$$37) \left((x^2)^3 \right)^4 = x^{2 \cdot 3 \cdot 4} = x^{24}$$

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

$$38) \left((y^3)^4 \right)^5 = y^{3 \cdot 4 \cdot 5} = y^{60}$$

$$39) \left((x^2)^x \right)^4 = x^{2 \cdot x \cdot 4} = x^{8x}$$

$$40) \left((y^3)^x \right)^y = y^{3 \cdot x \cdot y} = y^{3xy}$$

$$41) \left((x^2)^6 \right)^2 \cdot (x^3)^5 = x^{2 \cdot 6 \cdot 2} \cdot x^{3 \cdot 5} = x^{24} \cdot x^{15} = x^{24+15} = x^{39}$$

$$42) (y^3)^4 \cdot \left((y^5)^3 \right)^2 = y^{3 \cdot 4} \cdot y^{5 \cdot 3 \cdot 2} = y^{12} \cdot y^{30} = y^{12+30} = y^{42}$$

$$43) \left((x^2)^5 \right)^3 : (x^4)^7 = x^{2 \cdot 5 \cdot 3} : x^{4 \cdot 7} = x^{30} : x^{28} = x^{30-28} = x^2$$

$$44) \left((a^3)^6 \right)^8 : \left((a^2)^4 \right)^5 = a^{3 \cdot 6 \cdot 8} : a^{2 \cdot 4 \cdot 5} = a^{144} : a^{40} = a^{144-40} = a^{104}$$

$$\begin{aligned}
 45) \left(\frac{2}{3} a^2 b^3 \right)^3 : (2ab^2)^2 &= \left(\frac{2}{3} \right)^3 \cdot (a^2)^3 \cdot (b^3)^3 : \left[2^2 \cdot a^2 \cdot (b^2)^2 \right] = \\
 &= \frac{2^3}{3^3} \cdot a^{2 \cdot 3} \cdot b^{3 \cdot 3} : (4 \cdot a^2 \cdot b^{2 \cdot 2}) = \\
 &= \frac{8}{27} \cdot a^6 \cdot b^9 : (4 \cdot a^2 \cdot b^4) = \\
 &= \frac{8}{27} : 4 \cdot a^6 : a^2 \cdot b^9 \cdot b^4 = \\
 &= \frac{2}{27} \cdot a^{6-2} \cdot b^{9-4} = \\
 &= \frac{2}{27} a^4 b^5
 \end{aligned}$$

5. Koristimo pravila: $(ab)^n = a^n b^n$ $(abc)^n = a^n b^n c^n$ $(a^n)^m = a^{n \cdot m}$ $\left((a^n)^m\right)^z = a^{n \cdot m \cdot z}$

$$\begin{aligned}
 46) \quad \left(\frac{1}{2}x^2y^3\right)^3 \cdot (4x^3y^2)^3 &= \left(\frac{1}{2}\right)^3 \cdot (x^2)^3 \cdot (y^3)^3 \cdot \left[4^3 \cdot (x^3)^3 \cdot (y^2)^3\right] = \\
 &= \frac{1^3}{2^3} \cdot x^{2 \cdot 3} \cdot y^{3 \cdot 3} \cdot (64 \cdot x^{3 \cdot 3} \cdot y^{2 \cdot 3}) = \\
 &= \frac{1}{8} \cdot x^6 \cdot y^9 \cdot (64 \cdot x^9 \cdot y^6) = \\
 &= \frac{1}{8} \cdot 64 \cdot x^6 \cdot x^9 \cdot y^9 \cdot y^6 = \\
 &= \frac{64}{8} \cdot x^{6+9} \cdot y^{9+6} = \\
 &= 8 \cdot x^{15} \cdot y^{15} = \\
 &= 8x^{15}y^{15}
 \end{aligned}$$

$$\begin{aligned}
 47) \quad \left(\frac{1}{2}x^2y^3\right)^3 : (4x^3y^2)^3 &= \left(\frac{1}{2}\right)^3 \cdot (x^2)^3 \cdot (y^3)^3 : \left[4^3 \cdot (x^3)^3 \cdot (y^2)^3\right] = \\
 &= \frac{1^3}{2^3} \cdot x^{2 \cdot 3} \cdot y^{3 \cdot 3} : (64 \cdot x^{3 \cdot 3} \cdot y^{2 \cdot 3}) = \\
 &= \frac{1}{8} \cdot x^6 \cdot y^9 : (64 \cdot x^9 \cdot y^6) = \\
 &= \frac{1}{8} : 64 \cdot x^6 : x^9 \cdot y^9 : y^6 = \\
 &= \frac{1}{8 \cdot 64} \cdot x^{6-9} \cdot y^{9-6} = \\
 &= \frac{1}{512} \cdot x^{-3} \cdot y^3 = \\
 &= \frac{1}{512} \cdot \frac{1}{x^3} \cdot y^3 = \\
 &= \frac{y^3}{512x^3}
 \end{aligned}$$

$$\begin{aligned}
 48) \quad (3a^2b)^x \cdot (a^x b^{3x})^2 &= 3^x \cdot (a^2)^x \cdot b^x \cdot \left[(a^x)^2 \cdot (b^{3x})^2\right] = \\
 &= 3^x \cdot a^{2 \cdot x} \cdot b^x \cdot (a^{x \cdot 2} \cdot b^{3x \cdot 2}) = \\
 &= 3^x \cdot a^{2x} \cdot b^x \cdot (a^{2x} \cdot b^{6x}) = \\
 &= 3^x \cdot a^{2x} \cdot a^{2x} \cdot b^x \cdot b^{6x} = \\
 &= 3^x \cdot a^{2x+2x} \cdot b^{x+6x} = \\
 &= 3^x a^{4x} b^{7x}
 \end{aligned}$$

$$49) \quad (x^3)^{m+1} = x^{3 \cdot (m+1)} = x^{3m+3}$$

5. Koristimo pravila: $(ab)^n = a^n b^n$ $(abc)^n = a^n b^n c^n$ $(a^n)^m = a^{n \cdot m}$ $\left((a^n)^m\right)^z = a^{n \cdot m \cdot z}$

$$49) \quad (x^3)^{m+1} = x^{3 \cdot (m+1)} = x^{3m+3}$$

$$\begin{aligned} 50) \quad (x^3)^{2m-1} \cdot (x^2)^{m-1} &= x^{3 \cdot (2m-1)} \cdot x^{2 \cdot (m-1)} = \\ &= x^{6m-3} \cdot x^{2m-2} = \\ &= x^{6m-3+2m-2} = \\ &= x^{8m-5} \end{aligned}$$

$$\begin{aligned} 51) \quad (x^5)^{2m-1} : (x^3)^{m+1} &= x^{5 \cdot (2m-1)} : x^{3 \cdot (m+1)} = \\ &= x^{10m-5} : x^{3m+3} = \\ &= x^{10m-5-(3m+3)} = \\ &= x^{7m-8} \end{aligned}$$

$$\begin{aligned} 52) \quad 2(x^2)^3 + 3(x^3)^2 &= 2 \cdot x^{2 \cdot 3} + 3 \cdot x^{3 \cdot 2} = \\ &= 2 \cdot x^6 + 3 \cdot x^6 = \\ &= (2+3) \cdot x^6 = \\ &= 5x^6 \end{aligned}$$

$$\begin{aligned} 53) \quad (a^3)^4 - 3(a^2)^6 + 4(a^4)^3 &= a^{3 \cdot 4} - 3 \cdot a^{2 \cdot 6} + 4 \cdot a^{4 \cdot 3} = \\ &= a^{12} - 3 \cdot a^{12} + 4 \cdot a^{12} = \\ &= (1-3+4) \cdot a^{12} = \\ &= 2 \cdot a^{12} = \\ &= 2a^{12} \end{aligned}$$

6. Koristimo pravilo: $a^n b^n c^n = (abc)^n$

$$1) 2^x \cdot 5^x = (2 \cdot 5)^x = 10^x$$

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

$$3) 4^a \cdot 6^a = (4 \cdot 6)^a = 24^a$$

$$4) 2^y \cdot 4^y = (2 \cdot 4)^y = 8^y$$

$$5) \left(\frac{ac}{b}\right)^2 \cdot \left(\frac{b}{c}\right)^2 = \left(\frac{a \cdot c}{b} \cdot \frac{b}{c}\right)^2 = a^2$$

$$6) \left(\frac{a}{b}\right)^4 \cdot \left(\frac{b}{a}\right)^4 = \left(\frac{a}{b} \cdot \frac{b}{a}\right)^4 = 1^4 = 1$$

$$7) \left(\frac{3}{4}\right)^3 \cdot \left(\frac{8}{3}\right)^3 = \left(\frac{3}{4} \cdot \frac{8}{3}\right)^3 = \left(\frac{3 \cdot 4 \cdot 2}{4 \cdot 3}\right)^3 = 2^3 = 8$$

$$8) \left(\frac{xy}{2}\right)^2 \cdot \left(\frac{4}{x^2 y}\right)^2 = \left(\frac{xy}{2} \cdot \frac{4}{x^2 y}\right)^2 = \left(\frac{x \cdot y}{2} \cdot \frac{2 \cdot 2}{x \cdot x \cdot y}\right)^2 = \left(\frac{2}{x}\right)^2 = \text{možemo ostaviti u ovom obliku}$$

$$\text{ili dalje:} \quad = \frac{2^2}{x^2} = \frac{4}{x^2}$$

$$9) \left(\frac{xy}{z}\right)^3 \cdot \left(\frac{x}{yz}\right)^3 = \left(\frac{xy}{z} \cdot \frac{x}{yz}\right)^3 = \text{nakon kraćenja} = \left(\frac{x \cdot x}{z \cdot z}\right)^3 = \left(\frac{x^2}{z^2}\right)^3 = \frac{(x^2)^3}{(z^2)^3} = \frac{x^{2 \cdot 3}}{z^{2 \cdot 3}} = \frac{x^6}{z^6}$$

$$10) \left(\frac{xy}{z}\right)^{m+1} \cdot \left(\frac{x}{yz}\right)^{m+1} = \left(\frac{xy}{z} \cdot \frac{x}{yz}\right)^{m+1} = \text{nakon kraćenja} = \\ = \left(\frac{x \cdot x}{z \cdot z}\right)^{m+1} = \left(\frac{x^2}{z^2}\right)^{m+1} = \frac{(x^2)^{m+1}}{(z^2)^{m+1}} = \frac{x^{2 \cdot (m+1)}}{z^{2 \cdot (m+1)}} = \frac{x^{2m+2}}{z^{2m+2}}$$

$$11) \left(\frac{x^2 y^3}{z^4}\right)^2 \cdot \left(\frac{z^6}{x^3 y^2}\right)^2 = \left(\frac{x^2 y^3}{z^4} \cdot \frac{z^6}{x^3 y^2}\right)^2 = \left(\frac{x^2 \cdot y^2 \cdot y^1}{z^4} \cdot \frac{z^4 \cdot z^2}{x^2 \cdot x^1 \cdot y^2}\right)^2 = \text{nakon kraćenja} = \\ = \left(\frac{z^2}{x^1}\right)^2 = \frac{(z^2)^2}{(x^1)^2} = \frac{z^{2 \cdot 2}}{x^{1 \cdot 2}} = \frac{z^4}{x^2}$$

$$12) \left(\frac{x^2 y^3}{z^4}\right)^m \cdot \left(\frac{z^6}{x^3 y^2}\right)^m = \left(\frac{x^2 y^3}{z^4} \cdot \frac{z^6}{x^3 y^2}\right)^m = \left(\frac{x^2 \cdot y^2 \cdot y^1}{z^4} \cdot \frac{z^4 \cdot z^2}{x^2 \cdot x^1 \cdot y^2}\right)^m = \text{nakon kraćenja} = \\ = \left(\frac{y^1 \cdot z^2}{x^1}\right)^m = \frac{(y^1)^m \cdot (z^2)^m}{(x^1)^m} = \frac{y^{1 \cdot m} \cdot z^{2 \cdot m}}{x^{1 \cdot m}} = \frac{y^m z^{2m}}{x^m}$$

$$13) \left(\frac{x-y}{x+1}\right)^5 \cdot \left(\frac{x^2-1}{x^2+2xy+y^2}\right)^5 \cdot \left(\frac{x+y}{x-y}\right)^5 = \left(\frac{x-y}{x+1} \cdot \frac{x^2-1^2}{x^2+2xy+y^2} \cdot \frac{x+y}{x-y}\right)^5 = \\ = \left(\frac{x-y}{x+1} \cdot \frac{(x-1) \cdot (x+1)}{(x+y)^2} \cdot \frac{x+y}{x-y}\right)^5 = \\ = \left(\frac{(x-y)}{(x+1)} \cdot \frac{(x-1) \cdot (x+1)}{(x+y) \cdot (x+y)} \cdot \frac{(x+y)}{(x-y)}\right)^5 = \text{pa kratimo} = \\ = \left(\frac{x-1}{x+y}\right)^5 = \frac{(x-1)^5}{(x+y)^5}$$

7. Koristimo pravila: $\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}$ $\left(\frac{a}{b}\right)^{-n} = \left(\frac{b}{a}\right)^n = \frac{b^n}{a^n}$

Izračunaj:

1) $\left(\frac{2}{3}\right)^2 = \frac{2^2}{3^2} = \frac{4}{9}$ primjenili smo pravilo: $\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}$

2) $\left(\frac{2}{3}\right)^{-2} = \left(\frac{3}{2}\right)^2 = \frac{3^2}{2^2} = \frac{9}{4}$

uputa: 2) $\underbrace{\left(\frac{2}{3}\right)^{-2}}_{\substack{\text{po pravilu} \\ \left(\frac{a}{b}\right)^{-n} = \left(\frac{b}{a}\right)^n}} = \underbrace{\left(\frac{3}{2}\right)^2}_{\substack{\text{po pravilu: } \left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}}} = \frac{3^2}{2^2} = \frac{9}{4}$

3) $\left(\frac{1}{2}\right)^3 = \frac{1^3}{2^3} = \frac{1}{8}$ primjenili smo pravilo: $\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}$

4) $\left(\frac{2}{3}\right)^4 = \frac{2^4}{3^4} = \frac{16}{81}$ primjenili smo pravilo: $\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}$

5) $\left(\frac{5}{7}\right)^{-1} = \left(\frac{7}{5}\right)^1 = \frac{7}{5}$ primjenili smo pravilo: $\left(\frac{a}{b}\right)^{-n} = \left(\frac{b}{a}\right)^n = \frac{b^n}{a^n}$

6) $\left(1\frac{2}{7}\right)^{-1} = \left(\frac{1\cdot 7 + 2}{7}\right)^{-1} = \left(\frac{9}{7}\right)^{-1} = \frac{7}{9}$ → mješoviti broj treba prvo pretvoriti u razlomak...

7) $\left(\frac{4}{5}\right)^{-2} = \left(\frac{5}{4}\right)^2 = \frac{5^2}{4^2} = \frac{25}{16}$

8) $\left(\frac{2}{3}\right)^{-3} = \left(\frac{3}{2}\right)^3 = \frac{3^3}{2^3} = \frac{27}{8}$

9) $\left(2\frac{1}{3}\right)^{-2} = \left(\frac{2\cdot 3 + 1}{3}\right)^{-2} = \left(\frac{6+1}{3}\right)^{-2} = \left(\frac{7}{3}\right)^{-2} = \left(\frac{3}{7}\right)^2 = \frac{3^2}{7^2} = \frac{9}{49}$

↕ → mješoviti broj treba prvo pretvoriti u razlomak...

10) $\left(1\frac{2}{7}\right)^{-2} = \left(\frac{1\cdot 7 + 2}{7}\right)^{-2} = \left(\frac{7+2}{7}\right)^{-2} = \left(\frac{9}{7}\right)^{-2} = \left(\frac{7}{9}\right)^2 = \frac{7^2}{9^2} = \frac{49}{81}$

7. Koristimo pravila: $\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}$ $\left(\frac{a}{b}\right)^{-n} = \left(\frac{b}{a}\right)^n = \frac{b^n}{a^n}$

mješoviti broj treba prvo pretvoriti u razlomak...

$$11) \left(1\frac{1}{2}\right)^{-3} = \left(\frac{1\cdot 2+1}{2}\right)^{-3} = \left(\frac{2+1}{2}\right)^{-3} = \left(\frac{3}{2}\right)^{-3} = \left(\frac{2}{3}\right)^3 = \frac{2^3}{3^3} = \frac{8}{27}$$

$$12) \left(\frac{3}{4}\right)^{-2} = \left(\frac{4}{3}\right)^2 = \frac{4^2}{3^2} = \frac{16}{9}$$

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

14) I način koristimo pravilo:

$(-x)^{\text{na parni eksponent}} = x^{\text{parnu}}$
$(-x)^{\text{na neparni eksponent}} = -x^{\text{neparnu}}$

 pa je:

$$14) \left(-\frac{x}{y}\right)^2 = \left(\frac{x}{y}\right)^2 = \frac{x^2}{y^2} \quad \text{jer je: } \left(-\frac{x}{y}\right)^2 = \left(-\frac{x}{y}\right)^{\text{parnu}} = \left(\frac{x}{y}\right)^{\text{parnu}} = \left(\frac{x}{y}\right)^2 = \dots$$

$$14) \left(-\frac{x}{y}\right)^2 = \left(-1 \cdot \frac{x}{y}\right)^2 = (-1)^2 \cdot \left(\frac{x}{y}\right)^2 = 1 \cdot \frac{x^2}{y^2} = \frac{x^2}{y^2} \quad \text{II način}$$

II način $\left(-\frac{x}{y}\right)$ rastavili smo na: $\left(-1 \cdot \frac{x}{y}\right) \dots$

$$15) \left(-\frac{x}{y}\right)^3 = -\left(\frac{x}{y}\right)^3 = -\frac{x^3}{y^3} \quad \text{I način}$$

$$15) \left(-\frac{x}{y}\right)^3 = \left(-1 \cdot \frac{x}{y}\right)^3 = (-1)^3 \cdot \left(\frac{x}{y}\right)^3 = -1 \cdot \frac{x^3}{y^3} = -\frac{x^3}{y^3} \quad \text{II način}$$

16) I način koristimo pravilo:

$(-x)^{\text{na parni eksponent}} = x^{\text{parnu}}$
$(-x)^{\text{na neparni eksponent}} = -x^{\text{neparnu}}$

 pa je:

$$16) \left(-\frac{x}{y}\right)^4 = \left(\frac{x}{y}\right)^4 = \frac{x^4}{y^4} \quad \text{jer je: } (-x)^{\text{na parni eksponent}} = x^{\text{parnu}}$$

$$16) \text{ II način: } \left(-\frac{x}{y}\right)^4 = \left(-1 \cdot \frac{x}{y}\right)^4 = (-1)^4 \cdot \left(\frac{x}{y}\right)^4 = 1 \cdot \frac{x^4}{y^4} = \frac{x^4}{y^4}$$

$$17) \left(1\frac{1}{2}\right)^2 = \left(\frac{1\cdot 2+1}{2}\right)^2 = \left(\frac{2+1}{2}\right)^2 = \left(\frac{3}{2}\right)^2 = \frac{3^2}{2^2}$$

7. Koristimo pravila: $\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}$ $\left(\frac{a}{b}\right)^{-n} = \left(\frac{b}{a}\right)^n = \frac{b^n}{a^n}$

$$18) \left(-2\frac{2}{3}\right)^2 = \left(-\frac{2\cdot 3+2}{3}\right)^2 = \left(-\frac{6+2}{3}\right)^2 = \left(-\frac{8}{3}\right)^2 = \left(\frac{8}{3}\right)^2 = \frac{8^2}{3^2} = \frac{64}{9} \quad \text{I na\u0107in}$$

II na\u0107in:

$$18) \left(-2\frac{2}{3}\right)^2 = \left(-\frac{2\cdot 3+2}{3}\right)^2 = \left(-\frac{6+2}{3}\right)^2 = \left(-\frac{8}{3}\right)^2 = \left(-1\cdot\frac{8}{3}\right)^2 = (-1)^2 \cdot \left(\frac{8}{3}\right)^2 = 1 \cdot \frac{8^2}{3^2} = \frac{64}{9}$$

$$19) \left(-2\frac{2}{3}\right)^3 = \left(-\frac{2\cdot 3+2}{3}\right)^3 = \left(-\frac{6+2}{3}\right)^3 = \left(-\frac{8}{3}\right)^3 = -\left(\frac{8}{3}\right)^3 = -\frac{8^3}{3^3} = -\frac{512}{27} \quad \text{I na\u0107in}$$

II na\u0107in:

$$19) \left(-2\frac{2}{3}\right)^3 = \left(-\frac{2\cdot 3+2}{3}\right)^3 = \left(-\frac{6+2}{3}\right)^3 = \left(-\frac{8}{3}\right)^3 = \left(-1\cdot\frac{8}{3}\right)^3 = (-1)^3 \cdot \left(\frac{8}{3}\right)^3 = -1 \cdot \frac{8^3}{3^3} = -\frac{512}{27}$$

$$20) \left(3\frac{4}{5}\right)^2 = \left(\frac{3\cdot 5+4}{5}\right)^2 = \left(\frac{15+4}{5}\right)^2 = \left(\frac{19}{5}\right)^2 = \frac{19^2}{5^2} = \frac{361}{25}$$

$$21) \left(\frac{x^2}{y^3}\right)^4 = \frac{(x^2)^4}{(y^3)^4} = \frac{x^{2\cdot 4}}{y^{3\cdot 4}} = \frac{x^8}{y^{12}}$$

$$22) \left(-\frac{x^3}{y^4}\right)^3 = -\left(\frac{x^3}{y^4}\right)^3 = -\frac{(x^3)^3}{(y^4)^3} = -\frac{x^{3\cdot 3}}{y^{4\cdot 3}} = -\frac{x^9}{y^{12}} \quad \text{I na\u0107in}$$

$$22) \left(-\frac{x^3}{y^4}\right)^3 = \left(-1\cdot\frac{x^3}{y^4}\right)^3 = (-1)^3 \cdot \frac{(x^3)^3}{(y^4)^3} = -1 \cdot \frac{x^{3\cdot 3}}{y^{4\cdot 3}} = -\frac{x^9}{y^{12}} \quad \text{II na\u0107in}$$

$$23) \left(-\frac{x^3}{y^4}\right)^2 = \left(\frac{x^3}{y^4}\right)^2 = \frac{(x^3)^2}{(y^4)^2} = \frac{x^{3\cdot 2}}{y^{4\cdot 2}} = \frac{x^6}{y^8} \quad \text{I na\u0107in}$$

$$23) \left(-\frac{x^3}{y^4}\right)^2 = \left(-1\cdot\frac{x^3}{y^4}\right)^2 = (-1)^2 \cdot \frac{(x^3)^2}{(y^4)^2} = 1 \cdot \frac{x^{3\cdot 2}}{y^{4\cdot 2}} = \frac{x^6}{y^8} \quad \text{II na\u0107in}$$

7. Koristimo pravila: $\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}$ $\left(\frac{a}{b}\right)^{-n} = \left(\frac{b}{a}\right)^n = \frac{b^n}{a^n}$

$$24) \left(\frac{x^2 y^3}{z^4}\right)^2 = \frac{(x^2)^2 \cdot (y^3)^2}{(z^4)^2} = \frac{x^{2 \cdot 2} \cdot y^{3 \cdot 2}}{z^{4 \cdot 2}} = \frac{x^4 y^6}{z^8}$$

$$25) \left(\frac{x^2 y^5}{z^6}\right)^{-2} = \left(\frac{z^6}{x^2 y^5}\right)^2 = \frac{(z^6)^2}{(x^2)^2 \cdot (y^5)^2} = \frac{z^{6 \cdot 2}}{x^{2 \cdot 2} \cdot y^{5 \cdot 2}} = \frac{z^{12}}{x^4 y^{10}}$$

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

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

$$26) \left(\frac{2x^4}{3y^2 z}\right)^3 = \frac{2^3 \cdot (x^4)^3}{3^3 \cdot (y^2)^3 \cdot z^3} = \frac{8 \cdot x^{4 \cdot 3}}{27 \cdot y^{2 \cdot 3} \cdot z^3} = \frac{8x^{12}}{27y^6 z^3}$$

$$27) \left(\frac{x^{-2} y^3}{2^{-3} z^{-4}}\right)^3 = \left(\frac{2^3 y^3 z^4}{x^2}\right)^3 = \frac{(8y^3 z^4)^3}{(x^2)^3} = \frac{8^3 \cdot (y^3)^3 \cdot (z^4)^3}{(x^2)^3} = \frac{512 \cdot y^{3 \cdot 3} \cdot z^{4 \cdot 3}}{x^{2 \cdot 3}} = \frac{512y^9 z^{12}}{x^6}$$

Najkraće objašnjenje:

Sve što ima minus u eksponentu

"skače" iz brojnika u nazivnik i obrnuto...

Sada dodatna uputa: Razlomak $\frac{x^{-2} y^3}{2^{-3} z^{-4}}$

Ima u eksponentu "minus" pa se prvo rješavamo tih "minusa"

$$\frac{x^{-2} y^3}{2^{-3} z^{-4}} = \frac{2^3 y^3 z^4}{x^2} \quad \text{U brojniku je bio: } x^{-2} \text{ i on je "skočio" u nazivnik i sada je: } x^2$$

U nazivniku su bili: 2^{-3} i z^{-4} i oni su "skočili" u brojnik i sada su: 2^3 i z^4

7. Koristimo pravila: $\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}$ $\left(\frac{a}{b}\right)^{-n} = \left(\frac{b}{a}\right)^n = \frac{b^n}{a^n}$

$$28) \left(\frac{2x^4 y^{-2}}{5z^3}\right)^2 = \left(\frac{2x^4}{5y^2 z^3}\right)^2 =$$

$$= \frac{2^2 \cdot (x^4)^2}{5^2 \cdot (y^2)^2 \cdot (z^3)^2} = \frac{4 \cdot x^{4 \cdot 2}}{25 \cdot y^{2 \cdot 2} \cdot z^{3 \cdot 2}} = \frac{4x^8}{25y^4 z^6}$$

$$29) \left(\frac{2x^4 y^{-2}}{5z^3}\right)^{-2} = \left(\frac{2x^4}{5y^2 z^3}\right)^{-2} =$$

$$= \left(\frac{5y^2 z^3}{2x^4}\right)^2 =$$

$$= \frac{5^2 \cdot (y^2)^2 \cdot (z^3)^2}{2^2 \cdot (x^4)^2} =$$

$$= \frac{25 \cdot y^{2 \cdot 2} \cdot z^{3 \cdot 2}}{4 \cdot x^{4 \cdot 2}} =$$

$$= \frac{25y^4 z^6}{4x^8}$$

$$30) \left(\frac{2x^4 y^{-2}}{5z^3}\right)^3 = \left(\frac{2x^4}{5y^2 z^3}\right)^3 = \frac{2^3 \cdot (x^4)^3}{5^3 \cdot (y^2)^3 \cdot (z^3)^3} = \frac{8 \cdot x^{4 \cdot 3}}{125 \cdot y^{2 \cdot 3} \cdot z^{3 \cdot 3}} = \frac{8x^{12}}{125y^6 z^9}$$

$$31) \left(\frac{x}{y}\right)^{-1} = \left(\frac{y}{x}\right)^1 = \frac{y}{x}$$

$$32) \left(\frac{x}{y}\right)^{-2} \cdot \left(\frac{y}{x}\right)^3 = \left(\frac{y}{x}\right)^2 \cdot \frac{y^3}{x^3} = \frac{y^2}{x^2} \cdot \frac{y^3}{x^3} = \frac{y^2}{x^2} \cdot \frac{y^2 \cdot y^1}{x^2 \cdot x^1} = \frac{x^1}{y^1} = \frac{x}{y}$$

$$33) \left(\frac{2x-3}{2x+3}\right)^{-3} = \left(\frac{2x+3}{2x-3}\right)^3 = \frac{(2x+3)^3}{(2x-3)^3}$$

$$34) \left(\frac{1}{x-y}\right)^{-2} = \left(\frac{x-y}{1}\right)^2 = (x-y)^2$$

$$35) \left(\frac{a^2 b^5}{c^3}\right)^{-3} = \left(\frac{c^3}{a^2 b^5}\right)^3 = \frac{(c^3)^3}{(a^2)^3 \cdot (b^5)^3} = \frac{c^{3 \cdot 3}}{a^{2 \cdot 3} \cdot b^{5 \cdot 3}} = \frac{c^9}{a^6 b^{15}}$$

7. Koristimo pravila: $\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}$ $\left(\frac{a}{b}\right)^{-n} = \left(\frac{b}{a}\right)^n = \frac{b^n}{a^n}$

$$\begin{aligned}
 36) \quad \left(\frac{a^2}{y^3}\right)^3 \cdot \left(\frac{y}{a^3}\right)^2 \cdot \left(\frac{y^2}{a^4}\right)^2 &= \frac{(a^2)^3}{(y^3)^3} \cdot \frac{y^2}{(a^3)^2} \cdot \frac{(y^2)^2}{(a^4)^2} = \\
 &= \frac{a^{2 \cdot 3}}{y^{3 \cdot 3}} \cdot \frac{y^2}{a^{3 \cdot 2}} \cdot \frac{y^{2 \cdot 2}}{a^{4 \cdot 2}} = \\
 &= \frac{a^6}{y^9} \cdot \frac{y^2}{a^6} \cdot \frac{y^4}{a^8} = \\
 &= \frac{a^6}{y^7 \cdot y^2} \cdot \frac{y^2}{a^6} \cdot \frac{y^4}{a^8} = \quad \text{kratimo} \\
 &= \frac{1}{y^7} \cdot \frac{y^4}{a^8} = \\
 &= \frac{1}{y^7} \cdot \frac{a^8}{y^4} = \\
 &= \frac{a^8}{y^7 \cdot y^4} = \frac{a^8}{y^{7+4}} = \frac{a^8}{y^{11}}
 \end{aligned}$$

$$\begin{aligned}
 37) \quad \left(\frac{3}{2}\right)^{-2} \cdot 2^{-3} + 2^{-2} &= \left(\frac{2}{3}\right)^2 \cdot \frac{1}{2^3} + \frac{1}{2^2} = \frac{2^2}{3^2} \cdot \frac{1}{8} + \frac{1}{4} = \frac{4}{9} \cdot \frac{1}{4 \cdot 2} + \frac{1}{4} = \\
 &= \frac{1}{9 \cdot 2} + \frac{1}{4} = \frac{1}{18} + \frac{1}{4} = \frac{1 \cdot 2 + 1 \cdot 9}{36} = \frac{11}{36}
 \end{aligned}$$

$$38) \quad \frac{1}{8} \cdot \left(\frac{3}{4}\right)^{-2} = \frac{1}{8} \cdot \left(\frac{4}{3}\right)^2 = \frac{1}{8} \cdot \frac{4^2}{3^2} = \frac{1}{8} \cdot \frac{16}{9} = \frac{1}{8} \cdot \frac{8 \cdot 2}{9} = \frac{2}{9}$$

$$39) \quad \left(\frac{2}{3}\right)^{-1} + \left(\frac{1}{3}\right)^{-2} - \left(\frac{1}{2}\right)^{-3} = \left(\frac{3}{2}\right)^1 + \left(\frac{3}{1}\right)^2 - \left(\frac{2}{1}\right)^3 = \frac{3}{2} + 9 - 8 = \frac{3}{2} + 1 = \frac{3}{2} + \frac{2}{2} = \frac{5}{2}$$

$$\begin{aligned}
 40) \quad \left[\left(\frac{3}{4}\right)^{-2} \cdot \frac{2^{-2}}{3^{-3}}\right]^{-2} \cdot \left(\frac{3}{2}\right)^{-3} &= \left[\left(\frac{4}{3}\right)^2 \cdot \frac{3^3}{2^2}\right]^{-2} \cdot \left(\frac{2}{3}\right)^3 = \left[\frac{4^2}{3^2} \cdot \frac{27}{4}\right]^{-2} \cdot \frac{2^3}{3^3} = \\
 &= \left(\frac{16 \cdot 9 \cdot 3}{9 \cdot 4}\right)^{-2} \cdot \frac{8}{27} = (4 \cdot 3)^{-2} \cdot \frac{8}{27} = 12^{-2} \cdot \frac{8}{27} = \frac{1}{12^2} \cdot \frac{8}{27} = \frac{1}{144} \cdot \frac{8}{27} = \frac{1}{486}
 \end{aligned}$$

8. Koristimo pravila: $a^0 = 1$, $a^1 = a$, $a^{-1} = \frac{1}{a}$, $a^{-n} = \frac{1}{a^n}$

1) $2^0 = 1$ po pravilu: $a^0 = 1$

2) $x^0 = 1$

3) $\left(\frac{x^2 y^4}{z}\right)^0 = 1$ $\left\{ \begin{array}{l} \text{bez obzira što je u zagradi ako je eksponent} \\ \text{te zagrade nula sve je jednako jedan !} \end{array} \right.$

3) ili taj isti zadatak dužim postupkom: $\left(\frac{x^2 y^4}{z}\right)^0 = \frac{(x^2)^0 \cdot (y^4)^0}{z^0} = \frac{1 \cdot 1}{1} = \frac{1}{1} = 1$

4) $x^0 + y^0 = 1 + 1 = 2$

5) $3^0 = 1$

6) $(-3)^0 = 1$ po pravilu: $a^0 = 1$

7) $-3^0 = -1$ zato što je: $-3^0 = -1 \cdot 3^0 = -1 \cdot 1 = -1$

8) $-3x^0 = -3 \cdot 1 = -3$

9) $(x + y)^0 = 1$ bez obzira što je u zagradi ako je to na nultu sve je jednako jedan !

10) $(2x - 7y)^0 = 1$ $\left\{ \begin{array}{l} \text{bez obzira što je u zagradi ako je eksponent} \\ \text{te zagrade nula sve je jednako jedan !} \end{array} \right.$

11) $x^0 - 2y^0 + 7z^0 = 1 - 2 \cdot 1 + 7 \cdot 1 = 1 - 2 + 7 = 6$

12) $x^0 - (2y)^0 + (7z)^0 = 1 - 1 + 1 = 1$

13) $x^0 \cdot x^0 = 1 \cdot 1 = 1$

14) $(x^0)^2 = 1^2 = 1$

8. Koristimo pravila: $a^0 = 1$, $a^1 = a$, $a^{-1} = \frac{1}{a}$, $a^{-n} = \frac{1}{a^n}$

$$13) x^0 \cdot x^0 = 1 \cdot 1 = 1$$

$$14) (x^0)^2 = 1^2 = 1$$

$$15) (x^m)^0 = 1 \quad \text{bez obzira što je u zagradi ako je to na nuultu sve je jednako jedan !}$$

$$16) (4x)^0 = 1$$

$$17) 5^{-1} = \frac{1}{5} \quad \text{po pravilu: } a^{-1} = \frac{1}{a}$$

$$18) x^{-1} = \frac{1}{x}$$

$$19) 0,2^{-1} = \left(\frac{2}{10}\right)^{-1} = \left(\frac{1}{5}\right)^{-1} = \frac{5}{1} = 5 \quad \text{prvo decimalni broj pretvorimo u razlomak...}$$

$$20) (x-y)^{-1} = \frac{1}{(x-y)^1} = \frac{1}{x-y} \quad \text{po pravilu: } a^{-n} = \frac{1}{a^n}$$

$$21) 3^{-2} = \frac{1}{3^2} = \frac{1}{9} \quad \text{po pravilu: } a^{-n} = \frac{1}{a^n}$$

$$22) x^{-3} = \frac{1}{x^3}$$

$$23) 0,3^{-2} = \left(\frac{3}{10}\right)^{-2} = \left(\frac{10}{3}\right)^2 = \frac{10^2}{3^2} = \frac{100}{9}$$

$$24) (2x-5)^{-5} = \frac{1}{(2x-5)^5}$$

$$25) 4^{-1} = \frac{1}{4}$$

8. Koristimo pravila: $a^0 = 1$, $a^1 = a$, $a^{-1} = \frac{1}{a}$, $a^{-n} = \frac{1}{a^n}$

$$26) \frac{1}{4^{-1}} = \frac{1}{\frac{1}{4}} = \frac{1}{1} = \frac{1 \cdot 4}{1 \cdot 1} = 4 \quad \text{ili na drugi način: } \frac{1}{4^{-1}} = \frac{1 \cdot 4^1}{1} = 4$$

$$27) \frac{1}{(-4)^{-1}} = \frac{1}{\frac{1}{-4}} = \frac{1}{-1} = -\frac{1 \cdot 4}{1 \cdot 1} = -4 \quad \text{ili na drugi način: } \frac{1}{(-4)^{-1}} = \frac{1 \cdot (-4)^1}{1} = \frac{1 \cdot (-4)}{1} = -4$$

$$28) \left(\frac{2}{3}\right)^{-1} = \left(\frac{3}{2}\right)^1 = \frac{3}{2} \quad \text{prema pravilu: } \left(\frac{a}{b}\right)^{-n} = \left(\frac{b}{a}\right)^n = \frac{b^n}{a^n}$$

Isti taj zadatak po pravilu: $a^{-1} = \frac{1}{a}$ ispada: $\left(\frac{2}{3}\right)^{-1} = \frac{1}{\frac{2}{3}} = \frac{1}{2} = \frac{1}{2} = \frac{3 \cdot 1}{2 \cdot 1} = \frac{3}{2}$ vidimo da je rezultat isti!

$$29) \frac{2}{5^{-1}} = \frac{2 \cdot 5^1}{1} = 2 \cdot 5 = 10 \quad \text{ili kraće: } \frac{2}{5^{-1}} = 2 \cdot 5^1 = 2 \cdot 5 = 10$$

$$30) \frac{2}{(-5)^{-1}} = \frac{2 \cdot (-5)^1}{1} = 2 \cdot (-5) = -10$$

$$31) \frac{3}{2^{-2}} = \frac{3 \cdot 2^2}{1} = 3 \cdot 4 = 12$$

$$32) \frac{2a}{b^{-4}} = \frac{2a \cdot b^4}{1} = 2ab^4$$

$$33) 3^{5x-4} \cdot 3^{4x-3} \cdot 3^{7-9x} = 3^{5x-4+4x-3+7-9x} = 3^{5x+4x-9x-4-3+7} = 3^0 = 1$$

8. Koristimo pravila: $a^0 = 1$, $a^1 = a$, $a^{-1} = \frac{1}{a}$, $a^{-n} = \frac{1}{a^n}$

$$34) 2^{2x+1} \cdot 2^3 \cdot 2^{2-3x} \cdot 2^{x-6} = 2^{2x+1+3+2-3x+x-6} = 2^{2x-3x+x+1+3+2-6} = 2^0 = 1$$

$$35) 5^{2x-3} \cdot 5^{2-2x} = 5^{2x-3+2-2x} = 5^{2x-2x-3+2} = 5^{-1} = \frac{1}{5}$$

$$36) (x+y)^{2m-n} \cdot (x+y)^{n-2m} = (x+y)^{2m-n+n-2m} = (x+y)^{2m-2m+n-n} = (x+y)^0 = 1$$

$$37) 27^0 \cdot x^0 \cdot y^0 \cdot 2^1 \cdot \left(\frac{1}{3}\right)^{-1} = 1 \cdot 1 \cdot 1 \cdot 2 \cdot \left(\frac{3}{1}\right)^1 = 1 \cdot 2 \cdot 3 = 6$$

$$38) y^0 \cdot 2^{-1} \cdot \left(\frac{1}{2}\right)^1 \cdot \left(\frac{1}{5}\right)^{-1} \cdot 2^{-3} = 1 \cdot \frac{1}{2} \cdot \frac{1}{2} \cdot \left(\frac{5}{1}\right)^1 \cdot \frac{1}{2^3} = 1 \cdot \frac{1}{2} \cdot \frac{1}{2} \cdot 5 \cdot \frac{1}{8} = \frac{5}{32}$$

$$39) \left(\frac{a^2b}{c^3}\right)^{m+n} : \left(\frac{a^2b}{c^3}\right)^{m+2n} \cdot \left(\frac{a^2b}{c^3}\right)^n = \left(\frac{a^2b}{c^3}\right)^{m+n-(m+2n)+n} = \left(\frac{a^2b}{c^3}\right)^{m+n-m-2n+n} = \left(\frac{a^2b}{c^3}\right)^0 = 1$$

$$\begin{aligned} 40) \left(\frac{2^{-3} - 2^{-1}}{2^{-2} + 2^{-4}}\right)^{-2} &= \left(\frac{\frac{1}{2^3} - \frac{1}{2^1}}{\frac{1}{2^2} + \frac{1}{2^4}}\right)^{-2} = \left(\frac{\frac{1}{8} - \frac{1}{2}}{\frac{1}{4} + \frac{1}{16}}\right)^{-2} = \left(\frac{1 - 2 \cdot 4}{\frac{8}{1 \cdot 4 + 1}}\right)^{-2} = \\ &= \left(\frac{1-8}{\frac{8}{4+1}}\right)^{-2} = \left(\frac{-7}{\frac{8}{5}}\right)^{-2} = \left(-\frac{7 \cdot 16}{8 \cdot 5}\right)^{-2} = \left(-\frac{7 \cdot 2}{5}\right)^{-2} = \\ &= \left(-\frac{14}{5}\right)^{-2} = \left(-\frac{5}{14}\right)^2 = \left(-1 \cdot \frac{5}{14}\right)^2 = (-1)^2 \cdot \frac{5^2}{14^2} = 1 \cdot \frac{25}{196} = \frac{25}{196} \end{aligned}$$

$$\begin{aligned} 41) \left(\frac{2^{-2} \cdot 3^{-1}}{2^{-1} \cdot 3^{-2}}\right)^{-2} &= \left(\frac{\frac{1}{2^2} \cdot \frac{1}{3}}{\frac{1}{2} \cdot \frac{1}{3^2}}\right)^{-2} = \left(\frac{\frac{1}{4} \cdot \frac{1}{3}}{\frac{1}{2} \cdot \frac{1}{9}}\right)^{-2} = \left(\frac{\frac{1}{12}}{\frac{1}{18}}\right)^{-2} = \left(\frac{18}{12}\right)^{-2} = \\ &= \left(\frac{6 \cdot 3}{6 \cdot 2}\right)^{-2} = \left(\frac{3}{2}\right)^{-2} = \left(\frac{2}{3}\right)^2 = \frac{2^2}{3^2} = \frac{4}{9} \end{aligned}$$

8. Koristimo pravila: $a^0 = 1$, $a^1 = a$, $a^{-1} = \frac{1}{a}$, $a^{-n} = \frac{1}{a^n}$

$$42) \left(\frac{2^{-2} - 3^{-1}}{2^{-1} + 3^{-2}} \right)^{-2} = \left(\frac{\frac{1}{2^2} - \frac{1}{3}}{\frac{1}{2} + \frac{1}{3^2}} \right)^{-2} = \left(\frac{\frac{1}{4} - \frac{1}{3}}{\frac{1}{2} + \frac{1}{9}} \right)^{-2} = \left(\frac{\frac{3-4}{4 \cdot 3}}{\frac{9+2}{2 \cdot 9}} \right)^{-2} = \left(\frac{-\frac{1}{12}}{\frac{11}{18}} \right)^{-2} = \left(-\frac{18 \cdot 1}{11 \cdot 12} \right)^{-2} = \left(-\frac{3 \cdot 6}{11 \cdot 2 \cdot 6} \right)^{-2} = \left(-\frac{3}{22} \right)^{-2} = \left(-\frac{22}{3} \right)^2 = \left(-1 \cdot \frac{22}{3} \right)^2 = (-1)^2 \cdot \frac{22^2}{3^2} = 1 \cdot \frac{484}{9} = \frac{484}{9}$$

$$43) 3^0 \cdot 2^0 - 3^1 = 1 \cdot 1 - \frac{1}{3} = 1 - \frac{1}{3} = \frac{1 \cdot 3 - 1}{3} = \frac{3 - 1}{3} = \frac{2}{3}$$

$$44) 3^0 + 2^0 - 3^1 = 1 + 1 - \frac{1}{3} = 2 - \frac{1}{3} = \frac{2 \cdot 3 - 1}{3} = \frac{6 - 1}{3} = \frac{5}{3}$$

$$45) 2^0 + 2^1 - 2^{-2} = 1 + 2 - \frac{1}{2^2} = 3 - \frac{1}{4} = \frac{3 \cdot 4 - 1}{4} = \frac{12 - 1}{4} = \frac{11}{4}$$

$$46) 2^{-2} - 2^{-3} = \frac{1}{2^2} - \frac{1}{2^3} = \frac{1}{4} - \frac{1}{8} = \frac{1 \cdot 2 - 1}{8} = \frac{2 - 1}{8} = \frac{1}{8}$$

$$47) 2^{-3} - 2^{-2} + 2^{-1} = \frac{1}{2^3} - \frac{1}{2^2} + \frac{1}{2^1} = \frac{1}{8} - \frac{1}{4} + \frac{1}{2} = \frac{1 - 1 \cdot 2 + 1 \cdot 4}{8} = \frac{1 - 2 + 4}{8} = \frac{3}{8}$$

$$48) 3^{-2} - 2^{-3} = \frac{1}{3^2} - \frac{1}{2^3} = \frac{1}{9} - \frac{1}{8} = \frac{8 - 9}{9 \cdot 8} = \frac{-1}{72} = -\frac{1}{72}$$

$$49) \frac{2^{-2}}{3^{-3}} = \frac{\frac{1}{2^2}}{\frac{1}{3^3}} = \frac{\frac{1}{4}}{\frac{1}{27}} = \frac{1 \cdot 27}{4 \cdot 1} = \frac{27}{4}$$

ili isti zadatak na drugi način: $\frac{2^{-2}}{3^{-3}} = \frac{3^3}{2^2} = \frac{27}{4}$ vidi u 7. zadatku 27), 28), 29)

$$50) \frac{2^3 \cdot 3^{-2}}{4^2} = \frac{8 \cdot \frac{1}{3^2}}{16} = \frac{\frac{8}{9}}{16} = \frac{8 \cdot 1}{9 \cdot 16} = \frac{1}{9 \cdot 2} = \frac{1}{18}$$

ili isti zadatak na drugi način: $\frac{2^3 \cdot 3^{-2}}{4^2} = \frac{2^3}{4^2 \cdot 3^2} = \frac{8}{16 \cdot 9} = \frac{1}{2 \cdot 9} = \frac{1}{18}$

8. Koristimo pravila: $a^0 = 1$, $a^1 = a$, $a^{-1} = \frac{1}{a}$, $a^{-n} = \frac{1}{a^n}$

$$51) \frac{2^2 \cdot 4^{-1}}{3^2 \cdot 6^{-1}} = \frac{4 \cdot \frac{1}{4}}{9 \cdot \frac{1}{6}} = \frac{4}{9} = \frac{4}{\frac{6}{2}} = \frac{1 \cdot 2}{1 \cdot 3} = \frac{2}{3}$$

ili isti zadatak na drugi način: $\frac{2^2 \cdot 4^{-1}}{3^2 \cdot 6^{-1}} = \frac{4 \cdot 6^1}{9 \cdot 4^1} = \frac{6}{9} = \frac{2}{3}$

$$52) \frac{a^{-1}}{b^{-1}} = \frac{\frac{1}{a}}{\frac{1}{b}} = \frac{1 \cdot b}{a \cdot 1} = \frac{b}{a}$$

ili isti zadatak na drugi način: $\frac{a^{-1}}{b^{-1}} = \frac{b}{a}$

$$53) \frac{a^{-2}}{b^{-2}} = \frac{\frac{1}{a^2}}{\frac{1}{b^2}} = \frac{1 \cdot b^2}{a^2 \cdot 1} = \frac{b^2}{a^2} \quad \text{ili drugi način: } \frac{a^{-2}}{b^{-2}} = \frac{b^2}{a^2}$$

$$54) \frac{a^{-1}b}{c^{-1}} = \frac{b \cdot \frac{1}{a}}{\frac{1}{c}} = \frac{b}{a} = \frac{b \cdot c}{a \cdot 1} = \frac{bc}{a} \quad \text{ili drugi način: } \frac{a^{-1}b}{c^{-1}} = \frac{b \cdot c^1}{a^1} = \frac{bc}{a}$$

$$55) \frac{a^2b^{-3}}{c^{-1}d^2} = \frac{a^2 \cdot \frac{1}{b^3}}{\frac{1}{c^1} \cdot d^2} = \frac{a^2}{b^3} = \frac{a^2 \cdot c}{b^3 \cdot d^2} = \frac{a^2c}{b^3d^2}$$

ili drugi način: $\frac{a^2b^{-3}}{c^{-1}d^2} = \frac{a^2 \cdot c^1}{b^3 \cdot d^2} = \frac{a^2c}{b^3d^2}$

$$56) \frac{x^{-1}bc^2}{y^{-2}c^3d^{-1}} = \frac{\frac{1}{x^1} \cdot b \cdot c^2}{\frac{1}{y^2} \cdot c^3 \cdot \frac{1}{d^1}} = \frac{b \cdot c^2}{x} = \frac{b \cdot c^2 \cdot y^2 \cdot d}{x \cdot c^3} = \frac{b \cdot c^2 \cdot y^2 \cdot d}{x \cdot c^2 \cdot c^1} = \frac{bdy^2}{cx}$$

ili drugi način: $\frac{x^{-1}bc^2}{y^{-2}c^3d^{-1}} = \frac{b \cdot c^2 \cdot y^2 \cdot d^1}{c^3 \cdot x^1} = \frac{b \cdot c^2 \cdot y^2 \cdot d}{c^2 \cdot c^1 \cdot x} = \frac{bdy^2}{cx}$

$$57) \frac{x^{-1}b^{-2}c^2}{y^2c^{-3}d^{-1}} = \frac{\frac{1}{x^1} \cdot \frac{1}{b^2} \cdot c^2}{y^2 \cdot \frac{1}{c^3} \cdot \frac{1}{d^1}} = \frac{c^2}{x \cdot b^2} = \frac{c^2 \cdot c^3 \cdot d}{x \cdot b^2 \cdot y^2} = \frac{c^{2+3} \cdot d}{b^2xy^2} = \frac{c^5d}{b^2xy^2}$$

ili drugi način: $\frac{x^{-1}b^{-2}c^2}{y^2c^{-3}d^{-1}} = \frac{c^3 \cdot d^1 \cdot c^2}{x^1 \cdot y^2 \cdot b^2} = \frac{c^{3+2} \cdot d}{b^2xy^2} = \frac{c^5d}{b^2xy^2}$

9.