Vaja dela mojstra

1. **Izračunaj. Kaj ugotoviš?**

a) $(3 \cdot 4)^2 = 12^2 = 144$ b) $(10 : 5)^3 = 2^3 = 8$

$3^2 \cdot 4^2 = 9 \cdot 16 = 144$ $10^3 : 5^3 = 1000 : 125 = 8$

c) $\left(\frac{3 \cdot 4}{6}\right)^4 = \left(\frac{12}{6}\right)^4 = 2^4 = 16$

$\frac{3^4 \cdot 4^4}{6^4} = \frac{81 \cdot 256}{1296} = \frac{20736}{1296} = 20736 : 1296 = 16$

Odg.: a) $144 = 144$ b) $8 = 8$ c) $16 = 16$ Dobimo enak rezultat.

2. **Preoblikuj potenco v produkt potenc.**

a) $(x \cdot y)^2 = x^2y^2$ b) $(2 \cdot x)^3 = 8x^3$ c) $(-3 \cdot y)^4 = 81y^4$

č) $(x \cdot y \cdot z)^7 = x^7y^7z^7$ d) $(-0{,}5 \cdot x)^6 = 0{,}5^6x^6$ e) $(-1{,}8 \cdot y \cdot z)^5 = (-1{,}8)^5y^5z^5$

3. **Preoblikuj potenco ulomka v količnik potenc.**

a) $\left(\frac{2}{3}\right)^3 = \frac{2^3}{3^3} = \frac{8}{27}$ b) $\left(\frac{1}{4}\right)^2 = \frac{1^2}{4^2} = \frac{1}{16}$ c) $\left(1\frac{3}{5}\right)^5 = \frac{8^5}{5^5}$

č) $\left(\frac{a}{b}\right)^5 = \frac{a^5}{b^5}$ d) $\left(\frac{1}{b}\right)^2 = \frac{1^2}{b^2}$ e) $\left(-\frac{a \cdot b}{2}\right)^3 = -\frac{a^3b^3}{8}$

f) $\left(-\frac{2}{a \cdot b}\right)^4 = +\frac{2^4}{a^4b^4}$ g) $\left(-\frac{a \cdot b}{c}\right)^2 = \frac{a^2b^2}{c^2}$ h) $\left(\frac{5 \cdot a \cdot b}{4 \cdot c \cdot d}\right)^3 = \frac{5^3a^3b^3}{4^3c^3d^3}$

4. **Izračunaj.**

a) $2^3 \cdot 3^3 = (2 \cdot 3)^3 = 6^3 = 216$ b) $3^5 \cdot (-1)^5 = (-3)^5 = -243$

c) $(-4)^4 \cdot (-25)^4 = ((-4) \cdot (-25))^4 = 100^4 = 100000000$ č) $3^2 \cdot 4^2 \cdot 5^2 = (3 \cdot 4 \cdot 5)^2 = 60^2 = 3600$

d) $\left(\frac{3}{5}\right)^7 \cdot \left(\frac{5}{3}\right)^7 = \left(\frac{3}{5} \cdot \frac{5}{3}\right)^7 = 1^7 = 1$ e) $\left(\frac{15}{16}\right)^3 \cdot \left(\frac{8}{15}\right)^3 = \left(\frac{15}{16} \cdot \frac{8}{15}\right)^3 = \left(\frac{1}{2}\right)^3 = \frac{1}{8}$

f) $50^2 \cdot 0{,}2^2 = (50 \cdot 0{,}2)^2 = 10^2 = 100$ g) $0{,}08^5 \cdot 25^5 = (0{,}08 \cdot 25)^5 = 2^5 = 32$

5. **Preoblikuj v potenco količnika in izračunaj.**

a) $30^5 : 15^5 = (30 : 15)^5 = 2^5 = 32$

b) $48^3 : 16^3 = (48 : 16)^3 = 3^3 = 27$

c) $150^6 : (-75)^6 = (150 : (-75))^6 = (-2)^6 = 64$

č) $(-360)^2 : (-90)^2 = (-360 : (-90))^2 = 4^2 = 16$

d) $14{,}4^4 : 1{,}44^4 = (14{,}4 : 1{,}44)^4 = (1440 : 144)^4 = 10^4 = 10000$

e) $(-3{,}6)^2 : (-4{,}5)^2 = \left(\frac{36}{10} : \frac{45}{10}\right)^2 = \left(\frac{36}{10} \cdot \frac{10}{45}\right)^2 = \frac{16}{25}$

f) $3{,}75^4 : (-1{,}25)^4 = \left(\frac{375}{100} : \frac{125}{100}\right)^4 = \left(\frac{375}{100} \cdot \frac{100}{125}\right)^4 = 3^4 = 81$

g) $0{,}12^3 : 0{,}03^3 = (12 : 3)^3 = 4^3 = 64$

h) $\left(\frac{1}{2}\right)^3 : \left(\frac{5}{6}\right)^3 = \left(\frac{1}{2} \cdot \frac{6^3}{5}\right)^3 = \frac{27}{125}$

i) $\left(-\frac{3}{4}\right)^7 : \left(\frac{3}{4}\right)^7 = (-1)^7 = -1$

j) $\left(2\frac{2}{3}\right)^2 : \left(1\frac{9}{15}\right)^2 = \left(\frac{8}{3} : \frac{24}{15}\right)^2 = \left(\frac{8}{3} \cdot \frac{15}{24}\right)^2 = \left(\frac{5}{3}\right)^2 = \frac{25}{9} = 2\frac{7}{9}$

k) $\left(-\frac{13}{15}\right)^{10} : \left(-\frac{39}{45}\right)^{10} = \left(\frac{13}{15} \cdot \frac{45}{39}\right)^{10} = 1^{10} = 1$

6. Izračunaj.

a) $\frac{15^2 \cdot 8^2}{20^2} = \left(\frac{15 \cdot 8}{20}\right)^2 = 6^2 = 36$

b) $\frac{(-7)^3 \cdot (-1)^3}{(-21)^3} = \left(\frac{-7 \cdot 1}{21}\right)^3 = \left(-\frac{1}{3}\right)^3 = -\frac{1}{27}$

c) $\frac{9 \cdot 9^3}{27^4} = \frac{9^4}{27^4} = \left(\frac{9}{27}\right)^4 = \left(\frac{1}{3}\right)^4 = \frac{1}{81}$

č) $\frac{64^{10}}{(-64)^7 \cdot (-64)^3} = \frac{64^{10}}{(-64)^{10}} = \left(\frac{64}{64}\right)^{10} = 1^{10} = 1$

d) $8^4 \cdot 8^{-2} = 8^2 = 64$

e) $2^{-3} : 2^2 = 2^{-3-2} = 2^{-5} = \frac{1}{32}$

f) $3^6 \cdot 3^{-3} : 3^2 = 3^9 : 3^2 = 3^7 = 2187$ $\quad 243 = 3 \cdot 3 \cdot 3 \cdot 3 \cdot 3$ $\quad \frac{243 \cdot 9}{2187}$

g) $\frac{10^{-4} \cdot 10^5}{10^{-2}} = \frac{10^1}{10^{-2}} = 10^{1-(-2)} = 10^3 = 1000$

h) $\frac{4^{-1} \cdot 4^{-3}}{4^{-2} \cdot 4^{-4}} = \frac{4^{-4}}{4^{-6}} = 4^{-4-(-6)} = 4^2 = 16$

i) $\frac{2^{10} \cdot 2^{-8}}{2^6} = \frac{2^2}{2^6} = 2^{-4} = \frac{1}{16}$

7. Izračunaj.

a) $\frac{27^3 \cdot 3^4}{9^5} = \frac{(3^3)^3 \cdot 3^4}{(3^2)^5} = \frac{3^9 \cdot 3^4}{3^{10}} = \frac{3^{13}}{3^{10}} = 3^3$

b) $\frac{4^8 \cdot 8^4}{16^6} = \frac{2^{16} \cdot 2^{12}}{2^{24}} = \frac{2^{28}}{2^{24}} = 2^4$

c) $\frac{5^3 \cdot 125^4}{25^6} = \frac{5^3 \cdot 5^{12}}{5^{12}} = 5^3$