Potencije - zadatci

1) Izračunaj:

a) $10^2 =$ b) $10^3 =$ c) $10^4 =$ d) $(-10)^7 =$ e) $(-10)^8 =$

f) $-10^5 =$ g) $-10^8 =$ h) $-(-10)^3 =$ i) $-(-10)^4 =$ j) $-(-10^4) =$

2) Izračunaj:

a) $(-10)^2 \cdot 2 =$ b) $5 \cdot 10^3 + 1 =$ c) $(-10-(-10))^{15} =$ d) $-10 : (-10)^2 =$ e) $\frac{(-10)^3}{5} =$

3) Izračunaj:

a) $10^5 \cdot 10^3 =$ b) $10^7 \cdot 10^{-4} =$ c) $10^9 \cdot 10 =$ d) $10^4 : 10^3 =$ e) $(-10)^3 : (-10) =$

f) $10^{-4} : 10 =$ g) $(-10)^8 : (-10)^6 =$ h) $(-5)^5 : (-5)^7 =$ i) $10^{-3} : 10^{-6} =$ j) $(-10)^{-2} \cdot (-10)^{-6} =$

4) Potenciraj:

a) $(10 \cdot x)^4 =$ b) $(-10xy)^3 =$ c) $(10ab)^3 =$ d) $(-10x)^5 =$ e) $-(-ab)^7 =$

f) $\left(\frac{1}{10}\right)^2 =$ g) $(-10 : x)^3$ h) $\left(\frac{-1}{10}\right)^6 =$ i) $(-10a : b)^2 =$

5) Potenciraj potenciju:

a) $(10^4)^3 =$ b) $(10^{10})^{10} =$ c) $(2^3)^2 =$ d) $(a^0)^5 =$ e) $(-10^3)^2 =$

f) $(-10^2)^3 =$ g) $((-10)^3)^3 =$ h) $(-10^2)^1 =$ i) $((-10)^2)^5 =$ j) $\left(\left(\frac{-1}{10}\right)^2\right)^3 =$

6) Pojednostavni:

a) $10^3 \cdot 10^4 : 10^2 =$ b) $\left(\frac{1}{-10}\right)^3 \cdot 10^5 =$ c) $10^x \cdot 10^{2x} : 10^{3x} =$

d) $(-abc)^4 =$ e) $(10^2)^4 \cdot 10^4 : 10^6 : (10^2)^3 =$ f) $(10 : x)^3 \cdot \left(\frac{10}{x^2}\right)^3 =$

7) Dane potencije napiši kao razlomak i kao decimalni broj.

a) $-10^{-2} =$ b) $(-10)^{-2} =$ c) $(-10)^{-3} =$ d) $-10^{-3} =$

8) Razlomke napiši kao potencije s bazom 10 i negativnim cjelobrojnim eksponentom:

a) $\frac{1}{10} =$ b) $\frac{1}{100} =$ c) $\frac{-1}{1000} =$ d) $-\frac{1}{100000} =$ e) $\frac{1}{10000} =$

9) Pojednostavni:

a) $8 \cdot (-10)^2 + 2 \cdot (-10)^2 =$

b) $15 \cdot (-10)^5 + 7 \cdot (-10)^5 - 6 \cdot (-10)^5 =$

c) $4 \cdot (-10)^3 - 17 \cdot (-10)^3 - (-10)^3 =$

d) $6 \cdot 10^5 + 4 \cdot 10^5 - 4 \cdot 10^6 =$

e) $-10^3 + 4 \cdot 10^5 + 2 \cdot 10^5 + 6 \cdot 10^3 =$

f) $-2 \cdot (-10)^2 - (-10)^3 + 3 \cdot (-10)^2 + 5 \cdot (-10)^3 =$

10) Izračunaj:

a) $10^3 \cdot 10^{-4} : 10^5 =$

b) $(10^2)^6 \cdot 10^{-8} : 10^{-3} =$

c) $10^{-5} \cdot 10^3 : (10^2)^3 =$

d) $2 \cdot 10^{-2} - 0.01 =$

e) $4 \cdot 10^{-3} - 2 \cdot 10^2 + 5 \cdot 10^{-3} =$

f) $2 \cdot 10^{-2} + \frac{10}{10^3} + 5 : 10^2 - 10 : 10^3 =$

Potencije - rješenja

1)

a) $10^2 = 100$

b) $10^3 = 1000$

c) $10^4 = 10\,000$

d) $(-10)^7 = -10^7$

e) $(-10)^8 = 10^8$

f) $-10^5 = -10^5$

g) $-10^8 = -10^8$

h) $-(-10)^3 = 10^3$

i) $-(-10)^4 = -10^4$

j) $-(-10^4) = 10^4$

2)

a) $\mathbf{(-10)^2} \cdot 2 = \mathbf{100} \cdot 2 = 200$

b) $5 \cdot \mathbf{10^3} + 1 = \mathbf{5 \cdot 1\,000} + 1 = 5\,000 + 1 = 5\,001$

c) $(-10 - \mathbf{(-10)})^{15} = (\mathbf{-10 + 10})^{15} = 0^{15} = 0$

d) $-10 : (-10)^2 = \frac{-10}{100} = \frac{-1}{10}$

e) $\frac{(-10)^3}{5} = \frac{-1000}{5} = -200$

3) a) $10^5 \cdot 10^3 = 10^8$

b) $10^7 \cdot 10^{-4} = 10^3$

c) $10^9 \cdot 10 = 10^{10}$

d) $10^4 : 10^3 = 10^1 = 10$

e) $(-10)^3 : (-10) = (-10)^4 = 10^4$

f) $10^{-4} : 10 = 10^{-5}$

g) $(-10)^8 : (-10)^6 = (-10)^2 = 10^2$

h) $(-5)^5 : (-5)^7 = (-5)^{-2} = 5^{-2}$

i) $10^{-3} : 10^{-6} = 10^3$

j) $(-10)^{-2} \cdot (-10)^{-6} = (-10)^{-8} = 10^{-8}$

4)

a) $(10 \cdot x)^4 = 10^4 \cdot x^4 = 10\,000\,x^4$

b) $(-10xy)^3 = (-10)^3 \cdot x^3 \cdot y^3 = -1000\,x^3y^3$

c) $(10ab)^3 = 10^3 \cdot a^3 \cdot b^3 = 1000a^3b^3$

d) $(-10x)^5 = (-10)^5x^5 = -10^5\,x^5$

e) $-(-ab)^7 = -(-a^7 \cdot b^7) = a^7\,b^7$

f) $\left(\frac{1}{10}\right)^2 = \frac{1^2}{10^2} = \frac{1}{100}$

g) $(-10 : x)^3 = (-10)^3 : x^3$

$= -1000 : x^3$

h) $\left(\frac{-1}{10}\right)^6 = \frac{(-1)^6}{10^6}$

$= \frac{1}{10^6}$

i) $(-10a : b)^2 = (-10)^2 a^2 : b^2$

$= 100a^2 : b^2$

5) a) $(10^4)^3 = 10^{12}$

b) $(10^{10})^{10} = 10^{100}$

c) $(2^3)^2 = 2^6$

d) $(a^0)^5 = a^0 = 1$

e) $(-10^3)^2 = 10^6$

f) $(-10^2)^3 = -10^6$

g) $((-10)^3)^3 = (-10)^9 = -10^9$

h) $(-10^2)^1 = -10^2$

i) $((-10)^2)^5 = (-10)^{10} = 10^{10}$

j) $\left(\left(\frac{-1}{10}\right)^2\right)^3 = \left(\frac{-1}{10}\right)^6 = \frac{(-1)^6}{10^6} = \frac{1}{10^6}$

6) Pojednostavni:

a) $10^3 \cdot 10^4 : 10^2 = 10^{3+4-2} = 10^5$

b) $\left(\frac{1}{-10}\right)^3 \cdot 10^5 = \frac{1}{(-10)^3} \cdot 10^5 = \frac{-10^5}{10^3} = -10^2$

c) $10^x \cdot 10^{2x} : 10^{3x} = 10^0 = 1$

d) $(-abc)^4 = (-a)^4 \cdot b^4 \cdot c^4 = a^4 b^4 c^4$

e) $(10^2)^4 \cdot 10^4 : 10^6 : (10^2)^3 = 10^8 \cdot 10^4 : 10^6 : 10^6 = 10^0 = 1$

f) $(10 : x)^3 \cdot \left(\frac{10}{x^2}\right)^3 = \frac{10^3}{x^3} \cdot \frac{10^3}{x^6} = \frac{10^6}{x^9}$

7) a) $-10^{-2} = \frac{-1}{10^2} = \frac{-1}{100} = -0.01$

b) $(-10)^{-2} = \frac{1}{(-10)^2} = \frac{1}{100} = 0.01$

c) $(-10)^{-3} = \frac{1}{(-10)^3} = \frac{1}{-1000} = -0.001$

d) $-10^{-3} = \frac{-1}{1000} = -0.001$

8) a) $\frac{1}{10} = 10^{-1}$

b) $\frac{1}{100} = \frac{1}{10^2} = 10^{-2}$

c) $\frac{-1}{1000} = \frac{-1}{10^3} = -10^{-3}$

d) $-\frac{1}{100000} = -\frac{1}{10^5} = -10^{-5}$

e) $\frac{1}{10000} = 10^{-4}$

9) Pojednostavni:

a) $\mathbf{8} \cdot (-10)^2 + \mathbf{2} \cdot (-10)^2 = \mathbf{10} \cdot (-10)^2$

$= -1000$

b) $\mathbf{15} \cdot (-10)^5 + \mathbf{7} \cdot (-10)^5 - \mathbf{6} \cdot (-10)^5 = \mathbf{16} \cdot (-10)^5$

c) $4 \cdot (-10)^3 - 17 \cdot (-10)^3 - (-10)^3 = \mathbf{4} \cdot (-10)^3 - \mathbf{17} \cdot (-10)^3 - \mathbf{1} \cdot (-10)^3$

$= \mathbf{-14} \cdot 10^3$

$= -14\,000$

d) $\mathbf{6} \cdot 10^5 + \mathbf{4} \cdot 10^5 - 4 \cdot 10^6 = \underline{\mathbf{10} \cdot 10^5} - 4 \cdot 10^6$

$= 10^6 - 4 \cdot 10^6$

$= -3 \cdot 10^6$

e) $\underline{-10^3} + 4 \cdot 10^5 + 2 \cdot 10^5 \underline{+ 6 \cdot 10^3} = 5 \cdot 10^3 + 6 \cdot 10^5$

f) $\mathbf{-2} \cdot (-10)^2 - (-10)^3 + \mathbf{3} \cdot (-10)^2 + 5 \cdot (-10)^3 = (-10)^2 + 4 \cdot (-10)^3$

$= 100 - 4\,000$

$= -\,3\,900$

10)

a) $10^3 \cdot 10^{-4} : 10^{\mathbf{5}} = 10^{\,3-4-\mathbf{5}} = 10^{-6}$

b) $(10^2)^6 \cdot 10^{-8} : 10^{-3} = 10^{\,12} \cdot 10^{-8} : 10^{\mathbf{-3}}$

$= 10^{\,12-8+\mathbf{3}}$

$= 10^7$

c) $10^{-5} \cdot 10^3 : (10^2)^3 = 10^{-5} \cdot 10^3 : 10^{\mathbf{6}}$

$= 10^{\,-5+3-\mathbf{6}}$

$= 10^{-8}$

d) $2 \cdot 10^{-2} - 0.01 = 2 \cdot 0.01 - 0.01$

$= 0.02 - 0.01$

$= 0.01$

e) $4 \cdot 10^{-3} - 2 \cdot 10^2 + 5 \cdot 10^{-3} = 9 \cdot 10^{-3} - 2 \cdot 10^2$

$= 9 \cdot 0.001 - 2 \cdot 200$

$= 0.009 - 400$

$= -\,399.991$

f) $2 \cdot 10^{-2} + \underline{\dfrac{10}{10^3}} + 5 : 10^2 - 10 : 10^3 = 2 \cdot 10^{-2} + \underline{10^{-2}} + 5 \cdot 10^{-2} - 10^{-2}$

$= 7 \cdot 10^{-2}$

$= 0.07$