

Espressioni con le quattro operazioni e proprietà delle potenze.

Livello intermedio DUE. Completi di soluzione guidata.

Evaluating Expressions Involving Fractions – With solutions

1. $\left(\frac{1}{2}\right)^2 \cdot \left(\frac{1}{2}\right)^3 = \left(\frac{1}{2}\right)^{\dots} = -$ $\left(\frac{5}{6}\right)^8 : \left(\frac{5}{6}\right)^6 = \left(\frac{5}{6}\right)^{\dots} = -$ [soluzione](#)
2. $\left[\left(\frac{1}{2}\right)^2\right]^4 = [-]^{\dots} = -$ $\left(\frac{2}{3}\right)^4 \cdot \left(\frac{2}{3}\right)^8 : \left(\frac{2}{3}\right)^{10} = \left(\frac{2}{3}\right)^{\dots} = -$ [soluzione](#)
3. $\left[\left(\frac{3}{4}\right)^2\right]^4 : \left(\frac{3}{4}\right)^7 = [-]^{\dots} = -$ $\left(\frac{5}{3}\right)^3 \cdot \left(\frac{9}{25}\right)^3 = (-)^{\dots} = -$ [soluzione](#)
4. $\left[\left(\frac{5}{9}\right)^5 : \left(\frac{5}{9}\right)^4\right]^4 : \left(\frac{5}{9}\right)^2 = (-)^{\dots} = -$ $\left(\frac{25}{36}\right)^3 : \left(\frac{5}{18}\right)^3 = (-)^{\dots} = -$ [soluzione](#)
5. $\left\{\left[\left(\frac{2}{5}\right)^{10} : \left(\frac{2}{5}\right)^6\right]^2 \cdot \left[\left(\frac{2}{5}\right)^8 : \left(\frac{2}{5}\right)^3\right]\right\} : \left[\left(\frac{2}{5}\right)^{10} \cdot \frac{2}{5}\right]$ [4/25] [soluzione](#)
6. $\left(\frac{2}{3}\right)^2 : \left(\frac{4}{3}\right)^2 + \left(\frac{1}{3}\right)^3 : \left(\frac{1}{3}\right)^2 + \left(\frac{1}{2}\right)^4 : \left(\frac{1}{2}\right)^2 - \left(\frac{2}{3}\right)^5 : \left(\frac{2}{3}\right)^4 + \left(\frac{4}{3}\right)^3 : \left(\frac{4}{3}\right)^3 - \left(\frac{7}{2}\right)^0$ [1/6] [soluzione](#)
7. $\frac{1}{2} + \left\{\left[\left(1 + \frac{4}{3}\right)^4 \cdot \left(1 - \frac{2}{7}\right)^4\right]^2\right\}^6 : \left\{\left[\left(3 + \frac{2}{3}\right)^8 : \left(1 + \frac{1}{2} + \frac{7}{10}\right)^8\right]^2\right\}^3$ [3/2] [soluzione](#)
8. $\left\{\left[\left(\frac{1}{2}\right)^2\right]^3 \cdot \left[\left(\frac{1}{2}\right)^3\right]^3 : \left[\left(\frac{1}{2}\right)^3\right]^4\right\}^3 : \left[\left(\frac{1}{2}\right) \cdot \left(\frac{1}{2}\right)^3\right]^2$ $\left[\frac{1}{2}\right]$ [soluzione](#)
9. $\left\{\left[\left(\frac{7}{9}\right)^{14} : \left(\frac{7}{9}\right)^{10}\right]^2 : \left[\left(\frac{7}{9}\right)^3 \cdot \frac{7}{9} \cdot \left(\frac{7}{9}\right)^3\right]\right\} : \frac{7}{9}$ [1] [soluzione](#)
10. $\left(\frac{1}{3} - \frac{7}{33}\right)^2 : \left(\frac{1}{11}\right)^2 - \left(\frac{11}{9}\right)^4 : \left(\frac{11}{9}\right)^3$ $\left[\frac{5}{9}\right]$ [soluzione](#)
11. $\left\{\left[\left(\frac{3}{4}\right)^3 \cdot \left(\frac{3}{4}\right)^2\right]^2 : \left(\frac{3}{4}\right)^8 + \frac{3}{4}\right\} : \frac{7}{4} + \frac{2}{3}$ [soluzione](#)
12. $\left\{\left[\left(\frac{4}{5}\right)^3 \cdot \left(\frac{4}{5}\right)^2\right]^2 : \left(\frac{4}{5}\right)^9 + \frac{4}{5}\right\} : \frac{4}{5} - \frac{1}{2}$ [soluzione](#)

13. $\left(\frac{1}{2}\right)^6 : \left(\frac{1}{2}\right)^4 : \left(\frac{1}{2}\right)^2 + \left[\left(\frac{1}{2}\right)^2\right]^2 + \left(\frac{1}{2}\right)^0 - \left(\frac{1}{2}\right)^1$

[soluzione](#)

Soluzioni

$$\left(\frac{1}{2}\right)^2 \cdot \left(\frac{1}{2}\right)^3 = \left(\frac{1}{2}\right)^5 = \frac{1}{32}$$

$$\left(\frac{5}{6}\right)^8 : \left(\frac{5}{6}\right)^6 = \left(\frac{5}{6}\right)^2 = \frac{25}{36}$$

$$\left[\left(\frac{1}{2}\right)^2\right]^4 = \left[\frac{1}{2}\right]^6 = \frac{1}{64}$$

$$\left(\frac{2}{3}\right)^4 \cdot \left(\frac{2}{3}\right)^8 : \left(\frac{2}{3}\right)^{10} = \left(\frac{2}{3}\right)^2 = \frac{4}{9}$$

$$\left[\left(\frac{3}{4}\right)^2\right]^4 : \left(\frac{3}{4}\right)^7 = \left[\frac{3}{4}\right]^1 = \frac{3}{4}$$

$$\left(\frac{5}{3}\right)^3 \cdot \left(\frac{9}{25}\right)^3 = \left(\frac{3}{5}\right)^3 = \frac{27}{125}$$

$$\left[\left(\frac{5}{9}\right)^5 : \left(\frac{5}{9}\right)^4\right]^4 : \left(\frac{5}{9}\right)^2 = \left(\frac{5}{9}\right)^2 = \frac{25}{81}$$

$$\left(\frac{25}{36}\right)^3 : \left(\frac{5}{18}\right)^3 = \left(\frac{5}{2}\right)^3 = \frac{125}{8}$$

$$\begin{aligned} & \left\{ \left[\left(\frac{2}{5}\right)^{10} : \left(\frac{2}{5}\right)^6 \right]^2 \cdot \left[\left(\frac{2}{5}\right)^8 : \left(\frac{2}{5}\right)^3 \right] \right\} : \left[\left(\frac{2}{5}\right)^{10} \cdot \frac{2}{5} \right] = \\ & = \left\{ \left[\left(\frac{2}{5}\right)^{10-6} \right]^2 \cdot \left[\left(\frac{2}{5}\right)^{8-3} \right] \right\} : \left(\frac{2}{5}\right)^{10+1} = \\ & = \left\{ \left[\left(\frac{2}{5}\right)^4 \right]^2 \cdot \left(\frac{2}{5}\right)^5 \right\} : \left(\frac{2}{5}\right)^{11} = \\ & = \left\{ \left(\frac{2}{5}\right)^{4 \cdot 2} \cdot \left(\frac{2}{5}\right)^5 \right\} : \left(\frac{2}{5}\right)^{11} = \\ & = \left\{ \left(\frac{2}{5}\right)^8 \cdot \left(\frac{2}{5}\right)^5 \right\} : \left(\frac{2}{5}\right)^{11} = \\ & = \left(\frac{2}{5}\right)^{8+5} : \left(\frac{2}{5}\right)^{11} = \\ & = \left(\frac{2}{5}\right)^{13} : \left(\frac{2}{5}\right)^{11} = \\ & = \left(\frac{2}{5}\right)^{13-11} = \\ & = \left(\frac{2}{5}\right)^2 = \frac{4}{25} \end{aligned}$$

$$\begin{aligned}
 & \left(\frac{2}{3}\right)^2 : \left(\frac{4}{3}\right)^2 + \left(\frac{1}{3}\right)^3 : \left(\frac{1}{3}\right)^2 + \left(\frac{1}{2}\right)^4 : \left(\frac{1}{2}\right)^2 - \left(\frac{2}{3}\right)^5 : \left(\frac{2}{3}\right)^4 + \left(\frac{4}{3}\right)^3 : \left(\frac{4}{3}\right)^3 - \left(\frac{7}{2}\right)^0 = \\
 & = \left(\frac{2}{3} : \frac{4}{3}\right)^2 \left(\frac{1}{3}\right)^{3-2} + \left(\frac{1}{2}\right)^{4-2} - \left(\frac{2}{3}\right)^{5-4} + \left(\frac{4}{3}\right)^{3-3} - 1 = \\
 & = \left(\frac{1}{2}\right)^2 + \left(\frac{1}{3}\right)^1 + \left(\frac{1}{2}\right)^2 - \left(\frac{2}{3}\right)^1 + 1 - 1 = \\
 & = \frac{1}{4} + \frac{1}{3} + \frac{1}{4} - \frac{2}{3} = \\
 & = \frac{3+4+3-8}{12} = \\
 & = \frac{2}{12} = \frac{1}{6}
 \end{aligned}$$

$$\begin{aligned}
 & \frac{1}{2} + \left\{ \left[\left(1 + \frac{4}{3}\right)^4 \cdot \left(1 - \frac{2}{7}\right)^4 \right]^2 \right\}^6 : \left\{ \left[\left(3 + \frac{2}{3}\right)^8 : \left(1 + \frac{1}{2} + \frac{7}{10}\right)^8 \right]^2 \right\}^3 = \\
 & = \frac{1}{2} + \left\{ \left[\left(\frac{3+4}{3}\right)^4 \cdot \left(\frac{7-2}{7}\right)^4 \right]^2 \right\}^6 : \left\{ \left[\left(\frac{9+2}{3}\right)^8 : \left(\frac{10+5+7}{10}\right)^8 \right]^2 \right\}^3 = \\
 & = \frac{1}{2} + \left\{ \left[\left(\frac{7}{3}\right)^4 \cdot \left(\frac{5}{7}\right)^4 \right]^2 \right\}^6 : \left\{ \left[\left(\frac{11}{3}\right)^8 : \left(\frac{22^{11}}{10^5}\right)^8 \right]^2 \right\}^3 = \\
 & = \frac{1}{2} + \left\{ \left[\left(\frac{7}{3} \cdot \frac{5}{7}\right)^4 \right]^2 \right\}^6 : \left\{ \left[\left(\frac{11}{3} : \frac{11}{5}\right)^8 \right]^2 \right\}^3 = \\
 & = \frac{1}{2} + \left\{ \left[\left(\frac{5}{3}\right)^4 \right]^2 \right\}^6 : \left\{ \left[\left(\frac{5}{3}\right)^8 \right]^2 \right\}^3 = \\
 & = \frac{1}{2} + \left(\frac{5}{3}\right)^{4 \cdot 2 \cdot 6} : \left(\frac{5}{3}\right)^{8 \cdot 2 \cdot 3} = \\
 & = \frac{1}{2} + \left(\frac{5}{3}\right)^{48} : \left(\frac{5}{3}\right)^{48} = \\
 & = \frac{1}{2} + 1 = \frac{3}{2}
 \end{aligned}$$

$$\begin{aligned}
 & \left\{ \left[\left(\frac{1}{2} \right)^2 \right]^3 \cdot \left[\left(\frac{1}{2} \right)^3 \right]^3 : \left[\left(\frac{1}{2} \right)^3 \right]^4 \right\}^3 : \left[\left(\frac{1}{2} \right) \cdot \left(\frac{1}{2} \right)^3 \right]^2 = \\
 & = \left\{ \left(\frac{1}{2} \right)^6 \cdot \left(\frac{1}{2} \right)^9 : \left(\frac{1}{2} \right)^{12} \right\}^3 : \left[\left(\frac{1}{2} \right)^4 \right]^2 = \\
 & = \left\{ \left(\frac{1}{2} \right)^{15} : \left(\frac{1}{2} \right)^{12} \right\}^3 : \left(\frac{1}{2} \right)^8 = \\
 & = \left\{ \left(\frac{1}{2} \right)^3 \right\}^3 : \left(\frac{1}{2} \right)^8 = \\
 & = \left(\frac{1}{2} \right)^9 : \left(\frac{1}{2} \right)^8 = \frac{1}{2}
 \end{aligned}$$

$$\begin{aligned}
 & \left(\frac{1}{3} - \frac{7}{33}\right)^2 : \left(\frac{1}{11}\right)^2 - \left(\frac{11}{9}\right)^4 : \left(\frac{11}{9}\right)^3 \\
 &= \left(\frac{11-7}{33}\right)^2 : \left(\frac{1}{11}\right)^2 - \left(\frac{11}{9}\right)^{4-3} = \\
 &= \left(\frac{4}{33}\right)^2 : \left(\frac{1}{11}\right)^2 - \left(\frac{11}{9}\right)^1 = \\
 &= \left(\frac{4}{33} \cdot \frac{11}{1}\right)^2 - \frac{11}{9} = \\
 &= \left(\frac{4}{3}\right)^2 - \frac{11}{9} = \\
 &= \frac{16}{9} - \frac{11}{9} = \frac{5}{9}
 \end{aligned}$$

$$\begin{aligned}
 & \left\{ \left[\left(\frac{7}{9}\right)^{14} : \left(\frac{7}{9}\right)^{10} \right]^2 : \left[\left(\frac{7}{9}\right)^3 \cdot \frac{7}{9} \cdot \left(\frac{7}{9}\right)^3 \right] \right\} : \frac{7}{9} = \\
 &= \left\{ \left[\left(\frac{7}{9}\right)^{14-10} \right]^2 : \left[\left(\frac{7}{9}\right)^{3+1+3} \right] \right\} : \frac{7}{9} = \\
 &= \left\{ \left[\left(\frac{7}{9}\right)^4 \right]^2 : \left(\frac{7}{9}\right)^7 \right\} : \frac{7}{9} = \\
 &= \left\{ \left(\frac{7}{9}\right)^{4 \cdot 2} : \left(\frac{7}{9}\right)^7 \right\} : \frac{7}{9} = \\
 &= \left\{ \left(\frac{7}{9}\right)^8 : \left(\frac{7}{9}\right)^7 \right\} : \frac{7}{9} = \\
 &= \left\{ \left(\frac{7}{9}\right)^{8-7} \right\} : \frac{7}{9} = \frac{7}{9} : \frac{7}{9} = 1
 \end{aligned}$$

$$\begin{aligned}
 & \left\{ \left[\left(\frac{3}{4} \right)^3 \cdot \left(\frac{3}{4} \right)^{2 \cdot 2} \right] : \left(\frac{3}{4} \right)^8 + \frac{3}{4} \right\} : \frac{7}{4} + \frac{2}{3} = \\
 & = \left\{ \left(\frac{3}{4} \right)^{(3+2) \cdot 2} : \left(\frac{3}{4} \right)^8 + \frac{3}{4} \right\} \cdot \frac{4}{7} + \frac{2}{3} = \\
 & = \left\{ \left(\frac{3}{4} \right)^{10-8} + \frac{3}{4} \right\} \cdot \frac{4}{7} + \frac{2}{3} = \\
 & = \left\{ \frac{9}{16} + \frac{3}{4} \right\} \cdot \frac{4}{7} + \frac{2}{3} = \\
 & = \left\{ \frac{21}{16} \right\} \cdot \frac{4}{7} + \frac{2}{3} = \\
 & = \left\{ \frac{3}{4} \right\} \cdot \frac{1}{1} + \frac{2}{3} = \\
 & = \frac{3}{4} + \frac{2}{3} = \\
 & = \frac{9+8}{12} = \frac{17}{12}
 \end{aligned}$$

$$\begin{aligned}
 & \left\{ \left[\left(\frac{4}{5} \right)^3 \cdot \left(\frac{4}{5} \right)^{2 \cdot 2} \right] : \left(\frac{4}{5} \right)^9 + \frac{4}{5} \right\} : \frac{4}{5} - \frac{1}{2} = \\
 & = \left\{ \left(\frac{4}{5} \right)^{(3+2) \cdot 2} : \left(\frac{4}{5} \right)^9 + \frac{4}{5} \right\} \cdot \frac{5}{4} - \frac{1}{2} = \\
 & = \left\{ \left(\frac{4}{5} \right)^{10-9} + \frac{4}{5} \right\} \cdot \frac{5}{4} - \frac{1}{2} = \\
 & = \left\{ \frac{4}{5} + \frac{4}{5} \right\} \cdot \frac{5}{4} - \frac{1}{2} = \\
 & = \left\{ \frac{8}{5} \right\} \cdot \frac{5}{4} - \frac{1}{2} = \\
 & = 2 - \frac{1}{2} = \frac{4-1}{2} = \frac{3}{2}
 \end{aligned}$$

$$\left(\frac{1}{2}\right)^6 : \left(\frac{1}{2}\right)^4 : \left(\frac{1}{2}\right)^2 + \left[\left(\frac{1}{2}\right)^{2+2}\right]^2 + \left(\frac{1}{2}\right)^0 - \left(\frac{1}{2}\right)^1 =$$

Applico la proprietà delle potenze

$$a^m : a^n = a^{m-n} \quad \text{inoltre} \quad a^0 = 1 \quad \text{e} \quad a^1 = a \quad \forall a \in \mathbb{Q}$$

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

$$= \left(\frac{1}{2}\right)^{6-4-2} + \left(\frac{1}{2}\right)^{2 \cdot 2} + 1 - \frac{1}{2} =$$


$$= \left(\frac{1}{2}\right)^0 + \left(\frac{1}{2}\right)^4 + 1 - \frac{1}{2} =$$


$$= 1 + \frac{1}{16} + 1 - \frac{1}{2} =$$


$$= \frac{16 + 1 + 16 - 8}{16} =$$


$$= \frac{25}{16}$$


Keywords

 *Matematica, Aritmetica, Frazioni, Espressioni Q, addizione, sottrazione, moltiplicazione, divisione, esercizi con soluzioni*

 *Math, Arithmetic, Fraction expressions, Fraction, Expression, Addition, Subtraction, Multiplication, Division, Fraction expressions solved*

 *Matemática, Aritmética, Fracción, Expresiones, Resta, Sustracción, Suma, Adición, Multiplicación, División*

 *Mathématique, Arithmétique, Fraction, Problèmes avec fractions, Addition, Soustraction, Multiplication, Division*

 *Mathematik, Arithmetik, Bruchrechnung, Bruch, Subtraktion, Addition, Multiplikation, Division*

Arabic: كَسْر

Chinese (Simplified): 分数

Chinese (Traditional): 分數

Czech: zlomek

Danish: brøkdæl

Dutch: deel, breuk

Estonian: murd(arv)

Finnish: murtoluku

French: fraction

Greek: κλάσμα

Hungarian: hányad, tört(rész)

Icelandic: brot

Indonesian: pecahan

Japanese: 分数

Korean: 분수

Lithuanian: trupmena

Norwegian: brøk(del)

Polish: ułamek

Portuguese (Brazil): fração

Portuguese (Portugal): fracção

Romanian: fracție

Russian: дробь

Slovak: zlomek

Slovenian: ulomek

Swedish: del

Turkish: kesir