

OPERACIONES CON FRACCIONES:

Ejercicio nº 1.-

Opera y simplifica el resultado.

a) $2 - \frac{2}{3} : \frac{5}{2} + (-2) - \left(\frac{3}{4} + \frac{1}{2}\right)$

b) $\frac{5}{6} \cdot \frac{1}{4} - \frac{3}{2} \cdot \left[-\left(\frac{5}{2} + \frac{8}{3}\right) - \frac{5}{9} \right]$

Solución:

$$\begin{aligned} \text{a) } 2 - \frac{2}{3} : \frac{5}{2} + (-2) - \left(\frac{3}{4} + \frac{1}{2}\right) &= 2 - \frac{4}{15} - 2 - \left(\frac{3}{4} + \frac{2}{4}\right) = 2 - \frac{4}{15} - 2 - \frac{5}{4} = -\frac{4}{15} - \frac{5}{4} = -\frac{16}{60} - \frac{75}{60} = \\ &= -\frac{91}{60} \end{aligned}$$

$$\begin{aligned} \text{b) } \frac{5}{6} \cdot \frac{1}{4} - \frac{3}{2} \cdot \left[-\left(\frac{5}{2} + \frac{8}{3}\right) - \frac{5}{9} \right] &= \frac{5}{24} - \frac{3}{2} \cdot \left[-\left(\frac{15+16}{6} - \frac{5}{9}\right) \right] = \frac{5}{24} - \frac{3}{2} \cdot \left[-\frac{31}{6} - \frac{5}{9} \right] = \\ &= \frac{5}{24} - \frac{3}{2} \cdot \left[\frac{-93-10}{18} \right] = \frac{5}{24} - \frac{3}{2} \cdot \left[\frac{-103}{18} \right] = \frac{5}{24} + \frac{309}{36} = \frac{15+618}{72} = \frac{633}{72} = \frac{211}{24} \end{aligned}$$

Ejercicio nº 2.-

Reduce a una sola fracción y simplifica.

a) $\left(\frac{2}{3} - 2\right)\left(\frac{1}{2} + 5\right) - \left(4 + \frac{1}{3}\right)\left(2 - \frac{1}{3}\right)$

b) $\frac{3}{4} : \left[\frac{1}{5} : \left(\frac{5}{6} + \frac{5}{8} - \frac{3}{2}\right) - \frac{1}{2} \cdot \left(\frac{1}{3} + \frac{5}{6}\right) \right]$

Solución:

$$\text{a) } \left(\frac{2}{3} - 2\right)\left(\frac{1}{2} + 5\right) - \left(4 + \frac{1}{3}\right)\left(2 - \frac{1}{3}\right) = \left(\frac{2}{3} - \frac{6}{3}\right)\left(\frac{1}{2} + \frac{10}{2}\right) - \left(\frac{12}{3} + \frac{1}{3}\right)\left(\frac{6}{3} - \frac{1}{3}\right) =$$

$$= -\frac{4}{3} \cdot \frac{11}{2} - \frac{13}{3} \cdot \frac{5}{3} = -\frac{44}{6} - \frac{65}{9} = -\frac{22}{3} - \frac{65}{9} = -\frac{66}{9} - \frac{65}{9} = -\frac{131}{9}$$

$$\begin{aligned}
 \text{b) } & \frac{3}{4} : \left[\frac{1}{5} : \left(\frac{5}{6} + \frac{5}{8} - \frac{3}{2} \right) \right] - \frac{1}{2} \cdot \left(\frac{1}{3} + \frac{5}{6} \right) = \frac{3}{4} : \left[\frac{1}{5} : \left(\frac{20+15-36}{24} \right) - \frac{1}{2} \cdot \left(\frac{2+5}{6} \right) \right] = \\
 & = \frac{3}{4} : \left[\frac{1}{5} : \left(\frac{-1}{24} \right) - \frac{1}{2} \cdot \frac{7}{6} \right] = \frac{3}{4} : \left[-\frac{24}{5} - \frac{7}{12} \right] = \frac{3}{4} : \left[\frac{-288-35}{60} \right] = \frac{3}{4} : \frac{323}{60} = \frac{180}{1292} = \frac{45}{323}
 \end{aligned}$$

Ejercicio nº 3.-

Reduce a una sola fracción.

$$\text{a) } \frac{\frac{1}{8} + \frac{1}{2} \cdot \frac{3}{4}}{(-3) \cdot \left(\frac{2}{3} + \frac{1}{2} \right)}$$

$$\text{b) } - \left[- \left(\frac{3}{8} - \frac{7}{2} \right) \right] - \left[- \left(\frac{1}{5} + 1 \right) \cdot \frac{1}{3} - \frac{2}{5} : \frac{3}{2} \right]$$

Solución:

$$\text{a) } \frac{\frac{1}{8} + \frac{1}{2} \cdot \frac{3}{4}}{(-3) \cdot \left(\frac{2}{3} + \frac{1}{2} \right)} = \frac{\frac{1}{8} + \frac{3}{8}}{(-3) \cdot \left(\frac{4}{6} + \frac{3}{6} \right)} = \frac{\frac{4}{8}}{(-3) \cdot \frac{7}{6}} = \frac{\frac{1}{2}}{-\frac{7}{2}} = \frac{1}{2} : -\frac{7}{2} = -\frac{1}{7}$$

$$\begin{aligned}
 \text{b) } & - \left[- \left(\frac{3}{8} - \frac{7}{2} \right) \right] - \left[- \left(\frac{1}{5} + 1 \right) \cdot \frac{1}{3} - \frac{2}{5} : \frac{3}{2} \right] = - \left[- \left(\frac{3-28}{8} \right) \right] - \left[- \left(\frac{6}{5} \right) \cdot \frac{1}{3} - \frac{4}{15} \right] = \\
 & = \frac{-25}{8} - \left[-\frac{6}{15} - \frac{4}{15} \right] = -\frac{25}{8} + \frac{10}{15} = \frac{-375+80}{120} = \frac{-295}{120} = -\frac{59}{24}
 \end{aligned}$$