

29. Calcula el resultado de las siguientes operaciones y exprésalo en forma de fracción irreducible.

$$\begin{array}{ll} \text{a)} \frac{4}{9} : \frac{16}{3} - \frac{8}{5} : 2 + 12 \cdot \frac{3}{8} + 1 + 2 \cdot \frac{5}{6} & \text{d)} \frac{2}{3} - \left[ \frac{13}{18} - \frac{1}{4} \cdot \left( \frac{8}{15} - \frac{7}{10} \right) \right] + \frac{6}{9} : \frac{6}{15} \cdot \frac{6}{5} \\ \text{b)} \frac{49}{100} : 7 \cdot \frac{20}{7} + 3 - \left( \frac{2}{5} - \frac{1}{6} \cdot \frac{3}{2} \right)^2 + \frac{7}{15} - 3 & \text{e)} \frac{-41}{18} + \frac{2}{3} \cdot \left( \frac{16}{5} - \frac{9}{30} : \frac{3}{32} \right)^3 - 4 : \frac{9}{2} : \frac{5}{3} \\ \text{c)} \left( \frac{11}{42} + \frac{4}{7} \right) \cdot \frac{2}{5} - \frac{7}{5} \cdot \left( 2 - 2 \cdot \frac{4}{9} \right) + \frac{4}{15} : 8 & \text{f)} \frac{3}{5} : 2 - 2 \cdot \frac{3}{4} \cdot \left[ \frac{5}{6} - \frac{1}{3} \cdot \left( \frac{1}{2} - 2 \right) \right]^2 \end{array}$$

$$\begin{aligned} \text{a)} \quad \frac{4}{9} : \frac{16}{3} - \frac{8}{5} : 2 + 12 \cdot \frac{3}{8} + 1 + 2 \cdot \frac{5}{6} &= \frac{12}{144} - \frac{8}{10} + \frac{36}{8} + 1 + \frac{10}{6} = \frac{1}{12} - \frac{4}{5} + \frac{9}{2} + 1 + \frac{5}{3} = \\ &= \frac{5 - 48 + 270 + 60 + 100}{60} = \frac{387}{60} = \frac{129}{20} \end{aligned}$$

$$\begin{aligned} \text{b)} \quad \frac{49}{100} : 7 \cdot \frac{20}{7} + 3 - \left( \frac{2}{5} - \frac{1}{6} \cdot \frac{3}{2} \right)^2 + \frac{7}{15} - 3 &= \frac{7}{100} \cdot \frac{20}{7} - \left( \frac{2}{5} - \frac{1}{4} \right)^2 + \frac{7}{15} - 3 = \frac{1}{5} - \left( \frac{3}{20} \right)^2 + \frac{7}{15} = \\ &= \frac{1}{5} - \frac{9}{400} + \frac{7}{15} = \frac{240 - 27 + 560}{1200} = \frac{773}{1200} \end{aligned}$$

$$\begin{aligned} \text{c)} \quad \left( \frac{11}{42} + \frac{4}{7} \right) \cdot \frac{2}{5} - \frac{7}{5} \cdot \left( 2 - 2 \cdot \frac{4}{9} \right) + \frac{4}{15} : 8 &= \frac{35}{42} \cdot \frac{2}{5} - \frac{7}{5} \cdot \left( 2 - \frac{8}{9} \right) + \frac{1}{30} = \frac{1}{3} - \frac{7}{5} \cdot \frac{10}{9} + \frac{1}{30} = \\ &= \frac{1}{3} - \frac{70}{45} + \frac{1}{30} = \frac{30 - 140 + 3}{90} = \frac{-107}{90} \end{aligned}$$

$$\begin{aligned} \text{d)} \quad \frac{2}{3} - \left[ \frac{13}{18} - \frac{1}{4} \cdot \left( \frac{8}{15} - \frac{7}{10} \right) \right] + \frac{6}{9} : \frac{6}{15} \cdot \frac{6}{5} &= \frac{2}{3} - \left[ \frac{13}{18} - \frac{1}{4} \cdot \frac{-1}{6} \right] + \frac{6 \cdot 15 \cdot 6}{9 \cdot 6 \cdot 5} = \frac{2}{3} - \left[ \frac{13}{18} + \frac{1}{24} \right] + 2 = \\ &= \frac{2}{3} - \frac{55}{72} + 2 = \frac{48 - 55 + 144}{72} = \frac{137}{72} \end{aligned}$$

$$\text{e)} \quad \frac{-41}{18} + \frac{2}{3} \cdot \left( \frac{16}{5} - \frac{9}{30} : \frac{3}{32} \right)^3 - 4 : \frac{9}{2} : \frac{5}{3} = \frac{-41}{18} + \frac{2}{3} \cdot \left( \frac{16}{5} - \frac{16}{5} \right)^3 - \frac{8}{9} : \frac{5}{3} = \frac{-41}{18} - \frac{8}{15} = \frac{-205 - 48}{90} = \frac{-253}{90}$$

$$\begin{aligned} \text{f)} \quad \frac{3}{5} : 2 - 2 \cdot \frac{3}{4} \cdot \left[ \frac{5}{6} - \frac{1}{3} \cdot \left( \frac{1}{2} - 2 \right) \right]^2 &= \frac{3}{10} - \frac{3}{2} \cdot \left[ \frac{5}{6} - \frac{1}{3} \cdot \left( \frac{-3}{2} \right) \right]^2 = \frac{3}{10} - \frac{3}{2} \cdot \left[ \frac{5}{6} + \frac{1}{2} \right]^2 = \\ &= \frac{3}{10} - \frac{3}{2} \cdot \left[ \frac{4}{3} \right]^2 = \frac{3}{10} - \frac{3 \cdot 16}{2 \cdot 9} = \frac{3}{10} - \frac{8}{3} = \frac{-71}{30} \end{aligned}$$

64. Realiza las siguientes operaciones combinadas.

$$\text{a)} \frac{3}{4} + \frac{5}{4} \cdot \frac{2}{3} \qquad \text{b)} \frac{23}{12} + \frac{1}{5} : \left( \frac{4}{5} + 2 \right) \qquad \text{c)} \frac{5}{6} - \frac{2}{6} \cdot \left( \frac{9}{4} - \frac{1}{2} \right) \qquad \text{d)} \frac{5}{36} - \left( \frac{7}{16} + \frac{1}{4} : \frac{3}{5} \right)$$

$$\text{a)} \quad \frac{3}{4} + \frac{5}{4} \cdot \frac{2}{3} = \frac{3}{4} + \frac{5}{6} = \frac{9+10}{12} = \frac{19}{12}$$

$$\text{b)} \quad \frac{23}{12} + \frac{1}{5} : \left( \frac{4}{5} + 2 \right) = \frac{23}{12} + \frac{1}{5} : \frac{14}{5} = \frac{23}{12} + \frac{1}{14} = \frac{161+6}{84} = \frac{167}{84}$$

$$c) \frac{5}{6} - \frac{2}{6} \cdot \left( \frac{9}{4} - \frac{1}{2} \right) = \frac{5}{6} - \frac{1}{3} \cdot \frac{7}{4} = \frac{5}{6} - \frac{7}{12} = \frac{10-7}{12} = \frac{3}{12} = \frac{1}{4}$$

$$d) \frac{5}{36} - \left( \frac{7}{16} + \frac{1}{4} \cdot \frac{3}{5} \right) = \frac{5}{36} - \left( \frac{7}{16} + \frac{3}{20} \right) = \frac{5}{36} - \frac{21+20}{80} = \frac{20+123}{144} = \frac{143}{144}$$

65. Realiza las siguientes operaciones combinadas.

$$a) \left( \frac{11}{30} + \frac{4}{5} \right)^2 \cdot \frac{12}{21} - \frac{11}{5} \cdot \left( 4 - 3 \cdot \frac{4}{9} \right) + \frac{4}{5} : 6$$

$$b) \frac{2}{3} \cdot 5 - \left[ \frac{19}{18} - \frac{6}{5} \cdot \left( \frac{8}{15} - \frac{7}{10} \right) \right] + \frac{3}{4} : \frac{4}{5} \cdot \frac{12}{25}$$

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

$$a) \left( \frac{11}{30} + \frac{4}{5} \right)^2 \cdot \frac{12}{21} - \frac{11}{5} \cdot \left( 4 - 3 \cdot \frac{4}{9} \right) + \frac{4}{5} : 6 = \left( \frac{35}{30} \right)^2 \cdot \frac{4}{7} - \frac{11}{5} \cdot \left( 4 - \frac{4}{3} \right) + \frac{4}{30} = \left( \frac{7}{6} \right)^2 \cdot \frac{4}{7} - \frac{11}{5} \cdot \frac{8}{3} + \frac{2}{15} =$$

$$= \frac{7}{9} - \frac{88}{15} + \frac{2}{15} = \frac{35 - 264 + 6}{45} = \frac{-223}{45}$$

$$b) \frac{2}{3} \cdot 5 - \left[ \frac{19}{18} - \frac{6}{5} \cdot \left( \frac{8}{15} - \frac{7}{10} \right) \right] + \frac{3}{4} : \frac{4}{5} \cdot \frac{12}{25} = \frac{10}{3} - \left[ \frac{19}{18} - \frac{6}{5} \cdot \frac{16-21}{30} \right] + \frac{3 \cdot 5 \cdot 12}{4 \cdot 4 \cdot 25} = \frac{10}{3} - \left[ \frac{19}{18} - \frac{6}{5} \cdot \frac{-5}{30} \right] + \frac{3 \cdot 3}{4 \cdot 5} =$$

$$= \frac{10}{3} - \left[ \frac{19}{18} + \frac{1}{5} \right] + \frac{9}{20} = \frac{10}{3} - \frac{95+18}{90} + \frac{9}{20} = \frac{600 - 226 + 81}{180} = \frac{455}{180} = \frac{91}{36}$$

$$c) 2 - \left[ \frac{3}{5} + \left( \frac{1}{4} - \frac{3}{4} \cdot \left( -\frac{5}{2} \right) \right) \right] + 2 : \left( \frac{3}{4} - \frac{1}{6} \right)^2 = 2 - \left[ \frac{3}{5} + \left( \frac{1}{4} + \frac{15}{8} \right) \right] + 2 : \left( \frac{9-2}{12} \right)^2 = 2 - \left[ \frac{24}{40} + \frac{10}{40} + \frac{75}{40} \right] + 2 \cdot \frac{12^2}{7^2} =$$

$$= 2 - \frac{109}{40} + \frac{288}{49} = \frac{3920 - 5341 + 11520}{1960} = \frac{10099}{1960}$$