

Calculs en vrac (fractions, racines carrées, puissances) - correction des exercices -

Corrigé de l'exercice 4-1

$$A = \frac{2}{-\frac{4}{3}} - \left(\frac{4}{3}\right)^2 \stackrel{F3, P2}{\iff} A = -2 \times \frac{3}{4} - \frac{4^2}{3^2} \stackrel{F0}{\iff} A = -\frac{3}{2} - \frac{16}{9} \stackrel{F0}{\iff} A = -\frac{27}{18} - \frac{32}{18}$$

$$\stackrel{F1}{\iff} A = \boxed{-\frac{59}{18}}$$

$$B = -\frac{1}{2}(\sqrt{2} + \sqrt{3})^2 + \sqrt{6} \stackrel{D3}{\iff} B = -\frac{1}{2}((\sqrt{2})^2 + 2 \times \sqrt{2} \times \sqrt{3} + (\sqrt{3})^2) + \sqrt{6}$$

$$\stackrel{R0, R1}{\iff} B = -\frac{1}{2}(2 + 2\sqrt{6} + 3) + \sqrt{6} \stackrel{D1}{\iff} B = -\frac{2}{2} - \frac{2\sqrt{6}}{2} - \frac{3}{2} + \sqrt{6}$$

$$\stackrel{F1, F0}{\iff} B = -\frac{5}{2} - \sqrt{6} + \sqrt{6} \iff B = \boxed{-\frac{5}{2}}$$

$$C = \frac{3^4}{2} - \frac{3^5}{6} \stackrel{F0}{\iff} C = \frac{3^4}{2} - \frac{3^5}{2 \times 3^1} \stackrel{P2}{\iff} C = \frac{3^4}{2} - \frac{3^{5-1}}{2}$$

$$\iff C = \frac{3^4}{2} - \frac{3^4}{2} = \boxed{0}$$

$$D = \frac{1 - \frac{2}{3}}{-\frac{5}{9} + 2} \stackrel{F0}{\iff} D = \frac{\frac{3}{3} - \frac{2}{3}}{-\frac{5}{9} + \frac{3}{9}} \stackrel{F1}{\iff} D = \frac{\frac{1}{3}}{\frac{-5}{9} + \frac{3}{9}} \stackrel{F5}{\iff} D = \frac{1}{3} \times \frac{9}{13}$$

$$\iff D = \boxed{\frac{3}{13}}$$

$$E = \frac{(\sqrt{5})^8}{5^2} \stackrel{P3}{\iff} E = \frac{((\sqrt{5})^2)^4}{5^2} \stackrel{R0}{\iff} E = \frac{5^4}{5^2} \stackrel{P2}{\iff} E = 5^{4-2} \iff E = \boxed{5^2}$$

$$F = \frac{\sqrt{2-\frac{3}{4}}}{\sqrt{\frac{9}{2}-3}} \stackrel{F0, R2}{\iff} F = \frac{\sqrt{\frac{8}{4}-\frac{3}{4}}}{\sqrt{\frac{9}{2}-\frac{3}{2}}} \stackrel{F'1}{\iff} F = \frac{\sqrt{\frac{5}{4}}}{\sqrt{\frac{3}{2}}} \stackrel{F3}{\iff} F = \sqrt{\frac{5}{4} \times \frac{2}{3}}$$

$$\stackrel{F2, F0}{\iff} F = \boxed{\sqrt{\frac{5}{6}}}$$

$$G = 23^2 \stackrel{D3}{\iff} G = (20+3)^2 \iff G = 20^2 + 2 \times 20 \times 3 + 3^2$$

$$\iff G = 400 + 120 + 9 = \boxed{529}$$

$$H = \frac{(-\sqrt{3})^5}{9\sqrt{3}} \stackrel{P'1}{\iff} H = \frac{(-1)^5 (\sqrt{3})^5}{9\sqrt{3}} \stackrel{P2, P4}{\iff} H = \frac{-(\sqrt{3})^{5-1}}{9}$$

$$\stackrel{P3}{\iff} H = \frac{-(\sqrt{3})^4}{3^2} = -\frac{((\sqrt{3})^2)^2}{3^2} \stackrel{R0}{\iff} H = -\frac{3^2}{3^2} \iff H = \boxed{-1}$$

$$I = 2^3 \times \frac{7^5}{14^3} \stackrel{P'1}{\iff} I = 2^3 \times \frac{7^5}{(2 \times 7)^3} = \frac{2^3 \times 7^5}{2^3 \times 7^3} \stackrel{F0, P2}{\iff} I = 7^{5-3} \iff I = \boxed{7^2}$$

$$J = \frac{2-\frac{12}{5}}{\frac{3}{10}} - \frac{1}{\frac{6}{5}-2} \stackrel{F0}{\iff} J = \frac{\frac{10}{5}-\frac{12}{5}}{\frac{3}{10}} - \frac{1}{\frac{6}{5}-\frac{10}{5}} \stackrel{F'1}{\iff} J = \frac{-\frac{2}{5}}{\frac{3}{10}} - \frac{1}{-\frac{4}{5}}$$

$$\stackrel{F3}{\iff} J = -\frac{2}{5} \times \frac{10}{3} + \frac{5}{4} \stackrel{F2, F0}{\iff} J = -\frac{4}{3} + \frac{5}{4} \stackrel{F0}{\iff} J = -\frac{16}{12} + \frac{15}{12}$$

$$\stackrel{F1}{\iff} J = \boxed{-\frac{1}{12}}$$