

Corrigés: Nombres

Exercice 22

a) $\frac{13}{5} = 2,6$

$$\begin{array}{r} 13 \overline{) 5} \\ -10 \\ \hline 30 \\ -30 \\ \hline 0 \end{array}$$

b) $\frac{5}{6} = 0,8\overline{3}$

$$\begin{array}{r} 5 \overline{) 6} \\ -0 \\ \hline 50 \\ -48 \\ \hline 20 \\ -18 \\ \hline 20 \end{array}$$

c) $\frac{7}{4} = 1,75$

$$\begin{array}{r} 7 \overline{) 4} \\ -4 \\ \hline 30 \\ -28 \\ \hline 20 \\ -20 \\ \hline 0 \end{array}$$

d) $\frac{8}{3} = 2,6\overline{}$

$$\begin{array}{r} 8 \overline{) 3} \\ -6 \\ \hline 20 \\ -18 \\ \hline 20 \end{array}$$

e) $\frac{7}{11} = 0,6\overline{3}$

$$\begin{array}{r} 7 \overline{) 11} \\ -0 \\ \hline 70 \\ -66 \\ \hline 40 \\ -33 \\ \hline 70 \end{array}$$

f) $\frac{8}{13} = 0,615384\overline{}$

$$\begin{array}{r} 8 \overline{) 13} \\ -0 \\ \hline 80 \\ -78 \\ \hline 20 \\ -13 \\ \hline 70 \\ -65 \\ \hline 50 \\ -39 \\ \hline 110 \\ -104 \\ \hline 60 \\ -52 \\ \hline 80 \end{array}$$

g) $\frac{9}{7} = 1,285714\overline{}$

$$\begin{array}{r} 9 \overline{) 7} \\ -7 \\ \hline 20 \\ -14 \\ \hline 60 \\ -56 \\ \hline 40 \\ -35 \\ \hline 50 \\ -49 \\ \hline 10 \\ -7 \\ \hline 30 \\ -28 \\ \hline 20 \end{array}$$

h) $\frac{133}{20} = 6,65$

$$\begin{array}{r} 133 \overline{) 20} \\ -120 \\ \hline 130 \\ -120 \\ \hline 100 \\ -100 \\ \hline 0 \end{array}$$

i) $\frac{785}{60} = 13,08\overline{3}$

$$\begin{array}{r} 785 \overline{) 60} \\ -60 \\ \hline 185 \\ -180 \\ \hline 50 \\ -0 \\ \hline 500 \\ -480 \\ \hline 200 \\ -180 \\ \hline 200 \end{array}$$

Exercise 23

$$a) 0,62 = \frac{62}{100} \stackrel{:2}{=} \frac{31}{50}$$

$$b) 2,345 = \frac{2345}{1000} \stackrel{:5}{=} \frac{469}{200}$$

$$c) 0,\overline{7} = \frac{7}{9}$$

$$x = 0,\overline{7} \quad \text{1 chiffre}$$

$$10x - x = 7,\overline{7} - 0,\overline{7}$$

$$9x = 7$$

$$x = \frac{7}{9}$$

$$d) 1,0\overline{83} = \frac{1073}{990}$$

$$x = 1,0\overline{83} \quad \text{2 chiffres}$$

$$100x - x = 108,3\overline{83} - 1,0\overline{83}$$

$$99x = 107,3$$

$$x = \frac{107,3}{99} \stackrel{\cdot 10}{=} \frac{1073}{990}$$

$$e) 5,\overline{135} = \frac{570}{111}$$

$$x = 5,\overline{135} \quad \text{3 chiffres}$$

$$1000x - x = 5135,\overline{135} - 5,\overline{135}$$

$$999x = 5130$$

$$x = \frac{5130}{999} \stackrel{:3}{=} \frac{1710}{333} \stackrel{:3}{=} \frac{570}{111} \stackrel{:3}{=} \frac{190}{37}$$

$$f) 2,4\overline{2} =$$

$$x = 2,4\overline{2} \quad \text{1 chiffre}$$

$$10x - x = 24,\overline{22} - 2,4\overline{2}$$

$$9x = 21,8$$

$$x = \frac{21,8}{9} \stackrel{\cdot 10}{=} \frac{218}{90} \stackrel{:2}{=} \frac{109}{45}$$

Exercise 24

$$a) 12 + 4 \cdot 3 + 2 = 12 + 12 + 2 = 26$$

$$b) (12 + 4) \cdot 3 + 2 = 16 \cdot 3 + 2 = 48 + 2 = 50$$

$$c) 3 \cdot 5 + (2 \cdot 4 - 2) \cdot 6 = 15 + (8 - 2) \cdot 6 = 15 + 6 \cdot 6 = 15 + 36 = 51$$

$$d) (7 - 2)^2 : 5 \cdot 2^3 = 5^2 : 5 \cdot 8 = 25 : 5 \cdot 8 = 5 \cdot 8 = 40$$

$$e) 3 \cdot (2 - 7) \cdot (-1) - (6 - 9)^3 - 2^3 + 1 = 3 \cdot (-5) \cdot (-1) - (-3)^3 - 2^3 + 1 =$$

$$3 \cdot (-5) \cdot (-1) + (+27) - 8 + 1 = 15 + 27 - 8 + 1 = 35$$

$$f) \frac{5 - (2 - 8) \cdot 2}{2 \cdot (6 + 3) - 1} = \frac{5 - (-6) \cdot 2}{2 \cdot 9 - 1} = \frac{5 + (+12)}{18 - 1} = \frac{17}{17} = 1$$

$$g) 9 + 3 \cdot (2 \cdot (9 - 5) - (5 - 7)) = 9 + 3 \cdot (2 \cdot 4 + (+2)) = 9 + 3 \cdot (8 + 2) =$$

$$9 + 3 \cdot 10 = 9 + 30 = 39$$

$$h) \sqrt{36 + 64} = \sqrt{100} = 10$$

$$i) \sqrt{36} + \sqrt{64} = 6 + 8 = 14$$

Exercise 25

$$a) \frac{1}{8} + \frac{2}{3} + \frac{1}{2} = \frac{3}{24} + \frac{16}{24} + \frac{12}{24} = \frac{31}{24}$$

$$b) \frac{1}{2} + \frac{2}{3} + \frac{3}{4} = \frac{6}{12} + \frac{8}{12} + \frac{9}{12} = \frac{23}{12}$$

$$c) \frac{1}{10} + \frac{1}{100} + \frac{1}{1000} = \frac{100}{1000} + \frac{10}{1000} + \frac{1}{1000} = \frac{111}{1000}$$

$$d) \frac{3}{2} \cdot \left(\frac{2}{5} + \frac{5}{2} \right) = \frac{3}{2} \cdot \left(\frac{4}{10} + \frac{25}{10} \right) = \frac{3}{2} \cdot \frac{29}{10} = \frac{87}{20}$$

$$e) 1 + \frac{1}{3} \cdot \frac{4}{5} - 3 = 1 + \frac{4}{15} - 3 = \frac{15}{15} + \frac{4}{15} - \frac{45}{15} = -\frac{26}{15}$$

$$f) \left(\frac{1}{3} + \frac{1}{2} \right) : \left(\frac{1}{4} + \frac{1}{5} \right) = \left(\frac{2}{6} + \frac{3}{6} \right) : \left(\frac{5}{20} + \frac{4}{20} \right) = \frac{5}{6} : \frac{9}{20} = \frac{5}{6} \cdot \frac{20}{9} = \frac{50}{27}$$

$$g) \left(\frac{1}{5} + \frac{5}{3} \right)^2 = \left(\frac{3}{15} + \frac{25}{15} \right)^2 = \left(\frac{28}{15} \right)^2 = \frac{28^2}{15^2} = \frac{784}{225}$$

rappe! : $\frac{1}{\frac{7}{3}} = 1 : \frac{7}{3} = 1 \cdot \frac{3}{7} = \frac{3}{7}$

$$h) \frac{1}{1 + \frac{1}{2 + \frac{1}{3}}} = \frac{1}{1 + \frac{1}{\frac{6}{3} + \frac{1}{3}}} = \frac{1}{1 + \frac{1}{\frac{7}{3}}} = \frac{1}{1 + \frac{3}{7}} = \frac{1}{\frac{7}{7} + \frac{3}{7}} = \frac{1}{\frac{10}{7}} = \frac{7}{10}$$

$$i) \frac{1}{4 - \frac{1}{3 + \frac{2}{5}}} = \frac{1}{4 - \frac{1}{\frac{15}{5} + \frac{2}{5}}} = \frac{1}{4 - \frac{1}{\frac{17}{5}}} = \frac{1}{4 - \frac{5}{17}} = \frac{1}{\frac{68}{17} - \frac{5}{17}} = \frac{1}{\frac{63}{17}} = \frac{17}{63}$$

Exercise 26

$$a) \frac{18}{5} : \frac{14}{3} - \frac{8}{15} = \frac{18^9}{5} \cdot \frac{3}{14^7} - \frac{8}{15} = \frac{27}{35} - \frac{8}{15} = \frac{81}{105} - \frac{56}{105} = \frac{25}{105} \stackrel{:5}{=} \frac{5}{21}$$

$$b) \frac{51}{4} : \frac{21}{2} - \frac{2}{18^3} \cdot \frac{20^4}{7} = \frac{51}{2} \cdot \frac{2^1}{21^7} - \frac{8}{21} = \frac{17}{14} - \frac{8}{21} = \frac{51}{42} - \frac{16}{42} = \frac{35}{42} \stackrel{:7}{=} \frac{5}{6}$$

$$c) \left(\frac{4}{7} - \frac{3}{14} \right) \cdot \left(\frac{1}{3} + \frac{3}{5} \right) = \left(\frac{8}{14} - \frac{3}{14} \right) \cdot \left(\frac{5}{15} + \frac{9}{15} \right) = \frac{5^1}{14} \cdot \frac{14^1}{15^3} = \frac{1}{3}$$

$$d) \frac{4}{5} : \frac{2}{1} - \frac{2}{5} : \frac{10}{3} = \frac{4^2}{5} \cdot \frac{1}{2^1} - \frac{2}{5} \cdot \frac{3}{10^5} = \frac{2}{5} - \frac{3}{25} = \frac{10}{25} - \frac{3}{25} = \frac{7}{25}$$

$$e) \frac{11}{5} \cdot \left(\frac{11}{6} + \frac{2}{3} \right) = \frac{11}{5} \cdot \left(\frac{11}{6} + \frac{4}{6} \right) = \frac{11}{5} \cdot \frac{15^3}{6} = \frac{33}{6} \stackrel{:3}{=} \frac{11}{2}$$

$$f) \frac{5}{8} : \frac{1}{4} - \frac{5}{4} = \frac{5}{2} \cdot \frac{4^1}{8} - \frac{5}{4} = \frac{5}{2} - \frac{5}{4} = \frac{10}{4} - \frac{5}{4} = \frac{5}{4}$$

Exercise 27

$$a) \frac{\frac{5}{2} + \frac{13}{4}}{\frac{1}{2}} = \frac{\frac{10}{4} + \frac{13}{4}}{\frac{1}{2}} = \frac{\frac{23}{4}}{\frac{1}{2}} = \frac{23}{4} \cdot \frac{2^1}{1} = \frac{23}{2}$$

$$b) \frac{\frac{7}{5} - \frac{5}{7}}{\frac{3}{2} - \frac{2}{3}} = \frac{\frac{49}{35} - \frac{25}{35}}{\frac{9}{6} - \frac{4}{6}} = \frac{\frac{24}{35}}{\frac{5}{6}} = \frac{24}{35} \cdot \frac{6}{5} = \frac{144}{175}$$

$$c) \frac{\frac{5}{4} + \frac{1}{6}}{\frac{5}{12} + 1} = \frac{\frac{15}{12} + \frac{2}{12}}{\frac{5}{12} + \frac{12}{12}} = \frac{\frac{17}{12}}{\frac{17}{12}} = \frac{17^1}{12} \cdot \frac{12^1}{17^1} = 1$$

$$d) \frac{\frac{42}{5} - \frac{2}{3}}{\frac{7}{4} + \frac{11}{2}} = \frac{\frac{126}{15} - \frac{10}{15}}{\frac{7}{4} + \frac{22}{4}} = \frac{\frac{116}{15}}{\frac{29}{4}} = \frac{116^4}{15} \cdot \frac{4}{29^1} = \frac{16}{15}$$

Exercise 28

$$\begin{aligned}
 \text{a)} \quad & \left(12 + \frac{7}{4} - 1\right) \left(\frac{1}{2} - \frac{1}{3}\right) \left(\frac{2}{5} - 1\right) - (-3) \left(\frac{5}{3} - \frac{9}{4}\right) \left(2 + \frac{6}{7}\right) = \\
 & \left(\frac{48}{4} + \frac{7}{4} - \frac{4}{4}\right) \left(\frac{3}{6} - \frac{2}{6}\right) \left(\frac{2}{5} - \frac{5}{5}\right) - (-3) \left(\frac{20}{12} - \frac{27}{12}\right) \left(\frac{14}{7} + \frac{6}{7}\right) = \\
 & \frac{51}{4} \cdot \frac{1}{6} \cdot \left(-\frac{3}{5}\right) - (-3) \cdot \left(-\frac{7}{12}\right) \cdot \left(\frac{20}{7}\right) = -\frac{51}{40} - 5 = -\frac{51}{40} - \frac{200}{40} = -\frac{251}{40}
 \end{aligned}$$

$$\begin{aligned}
 \text{b)} \quad & \frac{3}{2} - \frac{2}{3} \left(-\frac{3}{4} - \left(\frac{1}{2} - \left(\frac{2}{3} - 1\right)\right)\right) = \frac{3}{2} - \frac{2}{3} \left(-\frac{3}{4} - \left(\frac{1}{2} + \left(+\frac{1}{3}\right)\right)\right) = \\
 & \frac{3}{2} - \frac{2}{3} \left(-\frac{3}{4} - \frac{5}{6}\right) = \frac{3}{2} - \frac{2}{3} \left(-\frac{19}{12}\right) = \frac{3}{2} + \frac{19}{18} = \frac{27}{18} + \frac{19}{18} = \frac{46}{18} = \frac{23}{9}
 \end{aligned}$$

$$\begin{aligned}
 \text{c)} \quad & \left(4 - \frac{2}{5} + \frac{4}{3} - \frac{2}{3}\right) : \left(-3 - 3 \cdot \frac{1}{2} - \frac{4}{5} + 2\right) = \left(\frac{60}{15} - \frac{6}{15} + \frac{20}{15} - \frac{10}{15}\right) : \left(-3 - \frac{3}{2} - \frac{4}{5} + 2\right) = \\
 & \frac{64}{15} : \left(-\frac{30}{10} - \frac{15}{10} - \frac{8}{10} + \frac{20}{10}\right) = \frac{64}{15} : \left(-\frac{33}{10}\right) = \frac{64}{15} \cdot \left(-\frac{10}{33}\right) = -\frac{128}{99}
 \end{aligned}$$