CORRIGE – M. QUET

EXERCICE 4.1 On donne l'expression littérale :

$$A = 3x - 2$$

a. $x = \frac{1}{2}$: $A = 3\times\frac{1}{2} - 2 = \frac{3}{2} - \frac{2\times 2}{1\times 2} = \frac{3}{2} - \frac{4}{2} = -\frac{1}{2}$

$x = \frac{3}{2}$: $A = 3\times\frac{3}{2} - 2 = \frac{9}{2} - \frac{2\times 2}{1\times 2} = \frac{9}{2} - \frac{4}{2} = \frac{5}{2}$

$x = \frac{3}{4}$: $A = 3\times\frac{3}{4} - 2 = \frac{9}{4} - \frac{2\times 4}{1\times 4} = \frac{9}{4} - \frac{8}{4} = \frac{1}{4}$

$x = \frac{2}{3}$: $A = 3\times\frac{2}{3} - 2 = 2 - 2 = 0$

b. Une solution de l'équation $3x - 2 = 0$ est $x = \frac{2}{3}$

EXERCICE 4.2 On donne l'expression littérale :

$$B = \frac{3}{2}x + \frac{5}{2}$$

a. $x = \frac{1}{2}$: $B = \frac{3}{2}\times\frac{1}{2} + \frac{5}{2} = \frac{3}{4} + \frac{5\times 2}{2\times 2} = \frac{3}{4} + \frac{10}{4} = \frac{13}{4}$

$x = \frac{5}{3}$: $B = \frac{3}{2}\times\frac{5}{3} + \frac{5}{2} = \frac{\boxed{3}\times 5}{2\times\boxed{3}} + \frac{5}{2} = \frac{10}{2} = 5$

$x = -\frac{4}{3}$: $B = \frac{3}{2}\times\left(-\frac{4}{3}\right) + \frac{5}{2} = -\frac{\boxed{3}\times 4}{2\times\boxed{3}} + \frac{5}{2} = \frac{1}{2}$

$x = -\frac{5}{3}$: $B = \frac{3}{2}\times\left(-\frac{5}{3}\right) + \frac{5}{2} = -\frac{\boxed{3}\times 5}{2\times\boxed{3}} + \frac{5}{2} = 0$

b. Une solution de l'équation $\frac{3}{2}x + \frac{5}{2} = 0$ est $x = -\frac{5}{3}$

EXERCICE 4.3 On donne l'expression littérale :

$$C = \frac{1}{2} - \frac{3}{4}x$$

a. $x = \frac{1}{3}$: $C = \frac{1}{2} - \frac{3}{4}\times\frac{1}{3} = \frac{1}{2} - \frac{\boxed{3}\times 1}{4\times\boxed{3}} = \frac{1\times 2}{2\times 2} - \frac{1}{4} = \frac{1}{4}$

$x = -\frac{2}{3}$: $C = \frac{1}{2} - \frac{3}{4}\times\left(-\frac{2}{3}\right) = \frac{1\times 2}{2\times 2} + \frac{2}{4} = \frac{4}{4} = 1$

$x = -\frac{1}{6}$: $C = \frac{1}{2} - \frac{3}{4}\times\left(-\frac{1}{6}\right) = \frac{1\times 4}{2\times 4} + \frac{1}{8} = \frac{5}{8}$

$x = \frac{2}{3}$: $C = \frac{1}{2} - \frac{3}{4}\times\frac{2}{3} = \frac{1}{2} - \frac{\boxed{3}\times 2}{4\times\boxed{3}} = \frac{1}{2} - \frac{1}{2} = 0$

b. Une solution de l'équation $\frac{1}{2} - \frac{3}{4}x = 0$ est $x = \frac{2}{3}$

EXERCICE 4.4 On donne 4 expressions littérales :

a. $x = \frac{5}{2}$: $A = 5\times\frac{5}{2} + 2 = \frac{25}{2} + \frac{2\times 2}{1\times 2} = \frac{25}{2} + \frac{4}{2} = \frac{29}{2}$

$B = 2\times\frac{5}{2} + 5 = \frac{2\times 5}{2} + 5 = 5 + 5 = 10$

$C = 2\times\frac{5}{2} - 5 = \frac{2\times 5}{2} - 5 = 5 - 5 = 0$

$D = 5\times\frac{5}{2} - 2 = \frac{25}{2} - \frac{2\times 2}{1\times 2} = \frac{25}{2} - \frac{4}{2} = \frac{21}{2}$

b. $\frac{5}{2}$ est une solution de l'équation $2x - 5 = 0$

EXERCICE 4.5 On donne 4 expressions littérales :

a. $x = -\frac{3}{7}$: $A = 3 + 7\times\left(-\frac{3}{7}\right) = 3 - 3 = 0$

$B = 3 - 7\times\left(-\frac{3}{7}\right) = 3 + 3 = 6$

$C = -3 + 7\times\left(-\frac{3}{7}\right) = -3 - 3 = -6$

$D = -3 - 7\times\left(-\frac{3}{7}\right) = -3 + 3 = 0$

b. $-\frac{3}{7}$ est une solution des équations $3 + 7x = 0$ et $-3 - 7x = 0$

EXERCICE 4.6 RESOUDRE $7x + 5 = 0$

$7\times\frac{5}{7} + 5 = 5 + 5 = 10$ $\qquad$ $7\times\frac{7}{5} + 5 = \frac{49}{5} + \frac{25}{5} = \frac{74}{5}$

$7\times\left(-\frac{5}{7}\right) + 5 = -5 + 5 = 0$

$7\times\left(-\frac{7}{5}\right) + 5 = -\frac{49}{5} + \frac{25}{5} = -\frac{24}{5}$

La solution de l'équation $7x + 5 = 0$ est $x = -\frac{5}{7}$

EXERCICE 4.7 RESOUDRE $\frac{5}{2}x + 3 = 0$

$\frac{\boxed{5}}{2}\times\frac{6}{\boxed{5}} + 3 = 3 + 3 = 6$ $\qquad$ $\frac{\boxed{5}}{2}\times\left(-\frac{1}{\boxed{5}}\right) + 3 = -\frac{1}{2} + \frac{6}{2} = \frac{5}{2}$

$\frac{\boxed{5}}{2}\times\left(-\frac{6}{\boxed{5}}\right) + 3 = -3 + 3 = 0$ $\qquad$ $\frac{\boxed{5}}{2}\times\frac{1}{\boxed{5}} + 3 = \frac{1}{2} + \frac{6}{2} = \frac{7}{2}$

La solution de l'équation $\frac{5}{2}x + 3 = 0$ est $x = -\frac{6}{5}$

EXERCICE 4.8 RESOUDRE $-\frac{1}{2} - \frac{3}{5}x = 0$

$-\frac{1}{2} - \frac{3}{5}\times\left(-\frac{3}{2}\right) = -\frac{1\times 5}{2\times 5} + \frac{9}{10} = -\frac{5}{10} + \frac{9}{10} = \frac{4}{10} = \frac{2}{5}$

$-\frac{1}{2} - \frac{\boxed{3}}{5}\times\left(-\frac{2}{\boxed{3}}\right) = -\frac{1}{2} + \frac{2}{5} = -\frac{5}{10} + \frac{4}{10} = -\frac{1}{10}$

$-\frac{1}{2} - \frac{3}{5}\times\frac{1}{5} = -\frac{1\times 25}{2\times 25} - \frac{3\times 2}{25\times 2} = -\frac{25}{50} + \frac{6}{50} = -\frac{19}{50}$

$-\frac{1}{2} - \frac{3}{5}\times\left(-\frac{5}{6}\right) = -\frac{1}{2} + \frac{\boxed{3}\times\boxed{5}}{\boxed{5}\times 2\times\boxed{3}} = -\frac{1}{2} + \frac{1}{2} = 0$

La solution de l'équation $-\frac{1}{2} - \frac{3}{5}x = 0$ est $x = -\frac{5}{6}$

EXERCICE 4.9 RESOUDRE $5x + 3 = 4 + 2x$

$x=\frac{5}{3}$: $5x+3=5\times\frac{5}{3}+3=\frac{25}{3}+\frac{9}{3}=\frac{34}{3}$

$4+2x=4+2\times\frac{5}{3}=\frac{12}{3}+\frac{10}{3}=\frac{22}{3}$

$x=\frac{4}{2}=2$: $5x+3=5\times2+3=10+3=13$

$4+2x=4+2\times2=4+4=8$

$x=\frac{2}{3}$: $5x+3=5\times\frac{2}{3}+3=\frac{10}{3}+\frac{9}{3}=\frac{19}{3}$

$4+2x=4+2\times\frac{2}{3}=\frac{12}{3}+\frac{4}{3}=\frac{16}{3}$

$x=\frac{1}{3}$: $5x+3=5\times\frac{1}{3}+3=\frac{5}{3}+\frac{9}{3}=\frac{14}{3}$

$4+2x=4+2\times\frac{1}{3}=\frac{12}{3}+\frac{2}{3}=\frac{14}{3}$

La solution de l'équation $5x + 3 = 4 + 2x$ est $x=\frac{1}{3}$

EXERCICE 4.10 RESOUDRE $\frac{5}{2}x+\frac{1}{3}=\frac{5}{6}$

$x=\frac{1}{3}$: $\frac{5}{2}x+\frac{1}{3}=\frac{5}{2}\times\frac{1}{3}+\frac{1}{3}=\frac{5}{6}+\frac{2}{6}=\frac{7}{6}$

$x=\frac{1}{4}$: $\frac{5}{2}x+\frac{1}{3}=\frac{5}{2}\times\frac{1}{4}+\frac{1}{3}=\frac{5}{8}+\frac{1}{3}=\frac{15}{24}+\frac{8}{24}=\frac{23}{24}$

$x=\frac{1}{5}$: $\frac{5}{2}x+\frac{1}{3}=\frac{\boxed{5}}{2}\times\frac{1}{\boxed{5}}+\frac{1}{3}=\frac{1}{2}+\frac{1}{3}=\frac{3}{6}+\frac{2}{6}=\frac{5}{6}$

$x=\frac{1}{6}$: $\frac{5}{2}x+\frac{1}{3}=\frac{5}{2}\times\frac{1}{6}+\frac{1}{3}=\frac{5}{12}+\frac{1}{3}=\frac{5}{12}+\frac{4}{12}=\frac{9}{12}=\frac{3}{4}$

La solution de l'équation $\frac{5}{2}x+\frac{1}{3}=\frac{5}{6}$ est $x=\frac{1}{5}$

EXERCICE 4.11 RESOUDRE $\frac{1}{2}x+\frac{3}{2}=\frac{3}{2}x+\frac{1}{4}$

$x=\frac{1}{2}$: $\frac{1}{2}x+\frac{3}{2}=\frac{1}{2}\times\frac{1}{2}+\frac{3}{2}=\frac{1}{4}+\frac{6}{4}=\frac{7}{4}$

$\frac{3}{2}x+\frac{1}{4}=\frac{3}{2}\times\frac{1}{2}+\frac{1}{4}=\frac{3}{4}+\frac{1}{4}=\frac{4}{4}=1$

$x=\frac{5}{4}$: $\frac{1}{2}x+\frac{3}{2}=\frac{1}{2}\times\frac{5}{4}+\frac{3}{2}=\frac{5}{8}+\frac{12}{8}=\frac{17}{8}$

$\frac{3}{2}x+\frac{1}{4}=\frac{3}{2}\times\frac{5}{4}+\frac{1}{4}=\frac{15}{8}+\frac{2}{8}=\frac{17}{8}$

$x=-\frac{5}{4}$: $\frac{1}{2}x+\frac{3}{2}=\frac{1}{2}\times\left(-\frac{5}{4}\right)+\frac{3}{2}=-\frac{5}{8}+\frac{12}{8}=\frac{7}{8}$

$\frac{3}{2}x+\frac{1}{4}=\frac{3}{2}\times\left(-\frac{5}{4}\right)+\frac{1}{4}=-\frac{15}{8}+\frac{2}{8}=-\frac{13}{8}$

$x=-\frac{1}{2}$: $\frac{1}{2}x+\frac{3}{2}=\frac{1}{2}\times\left(-\frac{1}{2}\right)+\frac{3}{2}=-\frac{1}{4}+\frac{6}{4}=\frac{5}{4}$

$\frac{3}{2}x+\frac{1}{4}=\frac{3}{2}\times\left(-\frac{1}{2}\right)+\frac{1}{4}=-\frac{3}{4}+\frac{1}{4}=-\frac{2}{4}=-\frac{1}{2}$

La solution de l'équation $\frac{1}{2}x+\frac{3}{2}=\frac{3}{2}x+\frac{1}{4}$ est $x=\frac{5}{4}$

EXERCICE 4.12 RESOUDRE $\frac{-\frac{5}{2}}{x}=\frac{5}{3}$

$x=\frac{5}{3}$: $\frac{-\frac{5}{2}}{x}=\frac{-\frac{5}{2}}{\frac{5}{3}}=-\frac{\boxed{5}}{2}\times\frac{3}{\boxed{5}}=-\frac{3}{2}$

$x=-\frac{7}{4}$: $\frac{-\frac{5}{2}}{x}=\frac{-\frac{5}{2}}{-\frac{7}{4}}=+\frac{5}{2}\times\frac{4}{7}=\frac{5\times\boxed{2}\times2}{\boxed{2}\times7}=\frac{10}{7}$

$x=-\frac{3}{2}$: $\frac{-\frac{5}{2}}{x}=\frac{-\frac{5}{2}}{-\frac{3}{2}}=+\frac{5}{\boxed{2}}\times\frac{\boxed{2}}{3}=\frac{5}{3}$

$x=\frac{-6}{4}$: $\frac{-\frac{5}{2}}{x}=\frac{-\frac{5}{2}}{-\frac{6}{4}}=+\frac{5}{2}\times\frac{4}{6}=\frac{5\times\boxed{2}\times\boxed{2}}{\boxed{2}\times\boxed{2}\times3}=\frac{5}{3}$

Bien sûr : $\frac{-6}{4}=-\frac{3}{2}$!!!

La solution de l'équation $\frac{-\frac{5}{2}}{x}=\frac{5}{3}$ est $x=-\frac{3}{2}$