

LDDR - Niveau 2 - TEF 2 : Ensembles

EXERCICE 1

$$A = \frac{(b+B)h}{2} \Leftrightarrow B = ?$$

$$\Leftrightarrow 2A = (b+B)h \Leftrightarrow \frac{2A}{h} = b+B \Leftrightarrow B = \frac{2A}{h} - b$$

EXERCICE 2

$$a) \quad 3(2x-5)^2 + 4x - 1 = (2x-3)(2x+3) + 4x + 7$$

$$\Leftrightarrow 3(4x^2 - 20x + 25) + 4x - 1 = 4x^2 - 9 + 4x + 7$$

$$\Leftrightarrow 12x^2 - 60x + 75 + 4x - 1 = 4x^2 + 4x - 2$$

$$\Leftrightarrow 8x^2 - 60x + 76 = 0$$

$$\Leftrightarrow 2x^2 - 15x + 19 = 0$$

$$\Delta = 225 - 152 = 73$$

$$x_{1,2} = \frac{15 \pm \sqrt{73}}{4}$$

$$b) \quad \frac{2-9x^2}{9x^2-4} + \frac{2x-1}{2-3x} = \frac{2}{3x-2} \Leftrightarrow$$

$$|(3x-2)(3x+2) \neq 0$$

$$\Leftrightarrow \boxed{x \neq \frac{2}{3} \text{ et } x \neq -\frac{2}{3}}$$

$$\Leftrightarrow \frac{2-9x^2}{(3x-2)(3x+2)} - \frac{2x-1}{3x-2} = \frac{2}{3x-2} \quad (\cdot (3x-2)(3x+2))$$

$$\Leftrightarrow 2-9x^2 - (2x-1)(3x+2) = 2(3x+2)$$

$$\Leftrightarrow 2-9x^2 - 6x^2 + 3x - 4x + 2 = 6x + 4$$

$$\Leftrightarrow -15x^2 - x + 4 = 6x + 4$$

$$\Leftrightarrow -15x^2 - 7x = 0 \Leftrightarrow -x(15x+7) = 0 \Leftrightarrow \begin{array}{l} x=0 \quad \checkmark \\ x=-\frac{7}{15} \quad \checkmark \end{array}$$

$$c) \frac{1}{\frac{1}{x+\frac{1}{a}} - a} = \frac{1}{2} \Leftrightarrow 2 = \frac{1}{x+\frac{1}{a}} - a \Leftrightarrow$$

$$\Leftrightarrow 2+a = \frac{1}{x+\frac{1}{a}} \Leftrightarrow x+\frac{1}{a} = \frac{1}{2+a} \Leftrightarrow$$

$$\Leftrightarrow x = \frac{1}{2+a} - \frac{1}{a} \Leftrightarrow x = \frac{a - (2+a)}{a(a+2)} \Leftrightarrow$$

$$\Leftrightarrow x = \frac{a-2-a}{a(a+2)} \Leftrightarrow \boxed{x = \frac{-2}{a(a+2)}} \quad \checkmark$$

Restrictions

$$x \neq -\frac{1}{a}$$

$$\frac{1}{x+\frac{1}{a}} - a \neq 0 \Leftrightarrow \frac{1}{x+\frac{1}{a}} \neq a \Leftrightarrow$$

$$\frac{1}{a} \neq x + \frac{1}{a} \Leftrightarrow \underline{x \neq 0}$$

EXERCISE 4

$$\begin{cases} 2x - y - 4z = -5 \\ 3x + 2y - z = 6 \\ -\frac{1}{2}x + \frac{3}{2}y + 3z = 5 \end{cases} \Leftrightarrow \begin{cases} 2x - y - 4z = -5 & \textcircled{1} \\ 3x + 2y - z = 6 & \textcircled{2} \\ -x + 3y + 6z = 10 & \textcircled{3} \end{cases}$$

$$\textcircled{1} \quad 2x - y - 4z = -5$$

$$\textcircled{2} * (-4) \quad + \quad -12x - 8y + 4z = -24$$

$$-10x - 9y = -29 \Leftrightarrow 10x + 9y = 29 \quad \textcircled{4}$$

$$\textcircled{2} * (6) \quad 18x + 12y - 6z = 36$$

$$\textcircled{3} \quad + \quad -x + 3y + 6z = 10$$

$$17x + 15y = 46 \quad \textcircled{b}$$

$$* (-3) \quad -51x + 45y = -138$$

$$10x + 9y = 29 \quad \textcircled{a}$$

$$* (5) \quad + \quad 50x + 45y = 145$$

$$-x = 7 \Leftrightarrow \boxed{x = -7}$$

$$\textcircled{b} \Rightarrow -70 + 9y = 29 \Leftrightarrow y = 99 \Leftrightarrow \boxed{y = 11}$$

$$\textcircled{1} \quad -14 - 11 - 4z = -5 \Leftrightarrow -25 - 4z = -5 \Leftrightarrow -20 = 4z$$

$$\Leftrightarrow \boxed{z = -5}$$

$$\begin{cases} x = -7 \\ y = 11 \\ z = -5 \end{cases}$$