

Correctif : Exercices de drill sur les équations du second degré niveau 3

1. $(3x - 3)^2 - (4x + 1)^2 = 8 \Leftrightarrow 9x^2 - 18x + 9 - 16x^2 - 8x - 1 - 8 = 0 \Leftrightarrow -7x^2 -$

$$26x = 0 \Leftrightarrow -x(7x + 26) = 0 \quad S = \left\{0; -\frac{26}{7}\right\}$$

2. $(5x - 3)(x - 5) = (2x + 5)^2 + 90 \Leftrightarrow 5x^2 - 25x - 3x + 15 = 4x^2 + 20x + 25 +$

$$90 \Leftrightarrow x^2 - 48x - 100 = 0 \quad \Delta = 2704 \quad x_2^1 = \frac{48 \pm 52}{2} \quad S = \{-2; 50\}$$

3. $(3x + 6)^2 = 12 - 3x^2 \Leftrightarrow 9x^2 + 36x + 36 = 12 - 3x^2 \Leftrightarrow 12x^2 + 36x + 24 = 0$

$$\Leftrightarrow x^2 + 3x + 2 = 0 \quad S = \{-1, -2\}$$

4. $\frac{x^2+x}{2} - \frac{x^2-x}{3} = x - \frac{1+x+x^2}{6} \Leftrightarrow 3x^2 + 3x - 2x^2 + 12x = 6x - 1 - x - x^2 \Leftrightarrow$

$$2x^2 = -1 \quad S = \emptyset$$

5. $\frac{x-2}{4} + \frac{x+4}{8} = \frac{x^2}{40} - \frac{x+3}{5} \Leftrightarrow 10x - 20 + 5x + 20 = x^2 - 8x - 24 \Leftrightarrow$

$$-x^2 + 23x + 24 = 0 \quad S = \{-1; 24\}$$

6. $\frac{(x-1)^2}{2} - \frac{(x-2)^2}{3} = \frac{x^2+2x-5}{6} \Leftrightarrow 3(x-1)^2 - 2(x-2)^2 = x^2 + 2x - 5 \Leftrightarrow$

$$3(x^2 - 2x + 1) - 2(x^2 - 4x + 4) = x^2 + 2x - 5 \Leftrightarrow$$

$$3x^2 - 6x + 3 - 2x^2 + 8x - 8 = x^2 + 2x - 5 \Leftrightarrow 0x = 0 \quad S = R$$

7. $x + \frac{1}{x} = 2 \Leftrightarrow x^2 + 1 = 2x \Leftrightarrow x^2 - 2x + 1 = 0 \Leftrightarrow (x - 1)^2 = 0 \Leftrightarrow x = 1$

$$S = \{1\} \quad CE : x \neq 0$$

$$8. \frac{(x+4)}{(x-2)} = \frac{x+1}{2} \Leftrightarrow 2x + 8 = x^2 - x - 2 \Leftrightarrow -x^2 + 3x + 10 = 0$$

$$\Leftrightarrow x = -2 \text{ ou } x = 5 \quad S = \{-2; 5\} \quad CE = x \neq 2$$

$$9. \frac{(3x+5)}{(2x+1)} = \frac{4x+7}{x-1} \Leftrightarrow (3x+5)(x-1) = (4x+7)(2x+1) \Leftrightarrow$$

$$3x^2 + 2x - 5 = 8x^2 + 18x + 7 \Leftrightarrow -5x^2 - 16x - 12 = 0 \quad \Delta = 16 \quad x_2^1 = \frac{16 \pm 4}{-10}$$

$$S = \left\{-2; -\frac{6}{5}\right\} \quad CE : x \neq -\frac{1}{2} \text{ et } x \neq 1$$

$$10. \frac{x-2}{x+3} - \frac{x+2}{x-3} = \frac{10x}{9-x^2} \Leftrightarrow x^2 - 5x + 6 - x^2 - 5x - 6 = -10x \Leftrightarrow$$

$$0x = 0 \quad \text{Equation indéterminée mais attention aux CE } x \neq 3 \text{ et } x \neq -3$$

$$S = R/\{-3; 3\}$$

$$11. \frac{2x+1}{x+2} - \frac{x-1}{x+3} = \frac{5}{x^2+5x+6} \Leftrightarrow 2x^2 + 7x + 3 - x^2 + x + 2 = 5 \Leftrightarrow x^2 + 6x = 0$$

$$x = 0 \text{ ou } x = -6 \quad S = \{-6; 0\}$$

$$CE : x \neq -2 \text{ et } x \neq -3 \text{ (qui sont aussi racines de } x^2 + 5x + 6)$$