

2.5.13 Résoudre les équations ci-dessous :

$$d) \frac{10x-2}{6x-3} + \frac{3x+5}{4x^2-1} = \frac{x-1}{2x+1}$$

$$\textcircled{1} \left. \begin{array}{l} 6x-3 = 3(2x-1) \\ 4x^2-1 = (2x-1)(2x+1) \\ 2x+1 \end{array} \right\} \text{ppmc : } 3(2x-1)(2x+1)$$

$$\frac{10x-2}{3(2x-1)} + \frac{3x+5}{(2x-1)(2x+1)} = \frac{x-1}{2x+1}$$

$$\frac{(10x-2)(2x+1)}{3(2x-1)(2x+1)} + \frac{(3x+5) \cdot 3}{3(2x-1)(2x+1)} = \frac{(x-1) \cdot 3(2x-1)}{3(2x-1)(2x+1)}$$

$$\textcircled{2} \text{ ED} = \mathbb{R} - \left\{ \frac{1}{2}; -\frac{1}{2} \right\}$$

Ensemble de Définition

③ On résout l'équation

$$(10x-2)(2x+1) + 3(3x+5) = 3(x-1)(2x-1)$$

$$20x^2 + 6x - 2 + 9x + 15 = 6x^2 - 9x + 3$$

$$14x^2 + 24x + 10 = 0$$

$$7x^2 + 12x + 5 = 0$$

$$(7x+5)(x+1) = 0$$

$$\textcircled{4} \quad x_1 = -\frac{5}{7} \quad \text{convient}$$

$$x_2 = -1 \quad \text{convient}$$

$$S = \left\{ -\frac{5}{7}; -1 \right\}$$

$$j) \sqrt{3x-5} - \sqrt{x-1} = \sqrt{4x-5} - \sqrt{2x-1}$$

$$\sqrt{3x-5} + \sqrt{2x-1} = \sqrt{4x-5} + \sqrt{x-1}$$

$$(\sqrt{A} + \sqrt{B})^2 = A + 2\sqrt{A}\sqrt{B} + B$$

$$(\quad)^2$$

⚠ On doit vérifier les solutions

$$\underline{3x-5} + 2\sqrt{3x-5}\sqrt{2x-1} + \underline{2x-1} = \underline{4x-5} + 2\sqrt{4x-5}\sqrt{x-1} + \underline{x-1}$$

$$\underline{5x-6} + 2\sqrt{3x-5}\sqrt{2x-1} = \underline{5x-6} + 2\sqrt{4x-5}\sqrt{x-1}$$

$$\cancel{2}\sqrt{3x-5}\sqrt{2x-1} = \cancel{2}\sqrt{4x-5}\sqrt{x-1} \quad | (\quad)^2$$

$$(3x-5)(2x-1) = (4x-5)(x-1)$$

$$6x^2 - 13x + 5 = 4x^2 - 9x + 5$$

$$2x^2 - 4x = 0$$

$$2x(x-2) = 0 \Leftrightarrow x_1 = 0 \text{ ou } x_2 = 2$$

Vérification

$$\sqrt{3x-5} + \sqrt{2x-1} = \sqrt{4x-5} + \sqrt{x-1}$$

$$\textcircled{1} \quad x_1 = 0$$

ne convient pas!

$$\textcircled{2} \quad x_2 = 2$$

$$\sqrt{6-5} + \sqrt{4-1} \stackrel{?}{=} \sqrt{8-5} + \sqrt{2-1}$$

$$1 + \sqrt{3} = \sqrt{3} + 1 \quad \text{convient!}$$

$$S = \{ 2 \}$$

$$\textcircled{1} \sqrt{A} - \sqrt{B} = \sqrt{C}$$

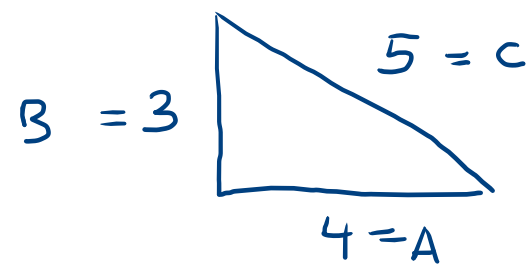
$$A - B \neq C$$

$$\textcircled{2} \sqrt{A} + \sqrt{B} = \sqrt{C} + \sqrt{D}$$

$$A + B \neq C + D$$

$$\sqrt{25} - \sqrt{9} = \sqrt{4}$$

$$25 - 9 \neq 4$$



$$A^2 + B^2 = C^2$$

$$A + B \neq C$$