

Interrogation de mathématique - 5*(Algèbre – Chap.2 – Trinôme du second degré)*

1) Résoudre les équations suivantes :

1) $3x^2 - 19x = 0$

2) $-3x^2 - 2x = -2$

3) $-4x^2 + 20x + 56 = 0$

4) $-12x + 9 = -4x^2$

5) $\sqrt{3}x^2 - 4x + 2\sqrt{3} = 0$

6) $-12x + 9 = -4x^2$

7) $\sqrt{3}x^2 - 4x + 2\sqrt{3} = 0$

8) $7x^2 + 11 = 18x$

9) $7x^2 - 14x - 56 = 0$

10) $6x^2 - 13x + 6 = 0$

$$1) \quad 3x^2 - 19x = 0 \quad \text{et } x \in \mathbb{R}$$

$$\Leftrightarrow x(3x - 19) = 0$$

$$\Leftrightarrow x \in \left\{ 0; \frac{19}{3} \right\}$$

$$2) \quad -3x^2 - 2x = -2 \quad \text{et } x \in \mathbb{R}$$

$$\Leftrightarrow -3x^2 - 2x + 2 = 0$$

$$\Leftrightarrow 3x^2 + 2x - 2 = 0$$

$$\Leftrightarrow \Delta = (2)^2 - 4 \cdot 3 \cdot (-2)$$

$$= 4 + 24 = 28 > 0$$

$$\text{et } x = \frac{-2 \pm \sqrt{28}}{6} = \frac{-2 \pm 2\sqrt{7}}{2 \cdot 3} = \frac{-1 \pm \sqrt{7}}{3}$$

$$\begin{cases} m+n = +2 \\ m \cdot n = -6 \end{cases} \Leftrightarrow \begin{cases} m = ? \\ n = ? \end{cases}$$

$$\Leftrightarrow x \in \left\{ \frac{-1 + \sqrt{7}}{3}; \frac{-1 - \sqrt{7}}{3} \right\}$$

$$3) \quad -4x^2 + 20x + 56 = 0 \quad \text{et } x \in \mathbb{R}$$

$$\Leftrightarrow 4x^2 - 20x - 56 = 0$$

$$\Leftrightarrow x^2 - 5x - 14 = 0 \quad \left. \begin{array}{l} \\ \\ \end{array} \right\} :4$$

$$\Leftrightarrow (x-7) \cdot (x+2) = 0$$

$$\Leftrightarrow x \in \{7; -2\}$$

$$\begin{cases} m+n = -5 \\ m \cdot n = -14 \end{cases} \Leftrightarrow \begin{cases} m = -7 \\ n = +2 \end{cases}$$

$$4) \quad -12x + 9 = -4x^2 \quad \text{et } x \in \mathbb{R}$$

$$\Leftrightarrow 4x^2 - 12x + 9 = 0$$

$$\Leftrightarrow (2x-3)^2 = 0 \quad \Leftrightarrow x \in \left\{ \frac{3}{2} \right\}$$

$$5) \quad \sqrt{3}x^2 - 4x + 2\sqrt{3} = 0 \quad \text{et } x \in \mathbb{R}$$

$$\Leftrightarrow \sqrt{3} \left(x^2 - \frac{4}{\sqrt{3}}x + 2 \right) = 0 \quad \left. \begin{array}{l} \\ \\ \end{array} \right\} : \sqrt{3}$$

$$\Leftrightarrow x^2 - \frac{4\sqrt{3}}{3}x + 2 = 0$$

$$\Leftrightarrow \Delta = \left(\frac{-4\sqrt{3}}{3} \right)^2 - 4 \cdot 1 \cdot 2 = \frac{16 \cdot 3}{9} - 8$$

$$= \frac{16}{3} - \frac{24}{3} = \frac{-8}{3} < 0 \quad \text{et } x \in \emptyset$$

$$\begin{cases} m+n = \frac{-4\sqrt{3}}{3} \\ m \cdot n = +2 \end{cases} \Leftrightarrow \begin{cases} m = ? \\ n = ? \end{cases}$$



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5) mienne (?)

$$\sqrt{3}x^2 - 4x + 2\sqrt{3} = 0 \text{ et } x \in \mathbb{R}$$

$$\Leftrightarrow \Delta = (-4)^2 - 4 \cdot \sqrt{3} \cdot 2\sqrt{3}$$

$$= 16 - 4 \cdot 6 = 16 - 24 = -8 < 0$$

et $x \in \emptyset$

$$\begin{cases} m+n = -4 \\ m \cdot n = \sqrt{3} \cdot 2\sqrt{3} = 6 \end{cases}$$

$$\Leftrightarrow \begin{cases} m = ? \\ n = ? \end{cases}$$

6) idem 4)

7) idem 5)

8) $7x^2 + 11 = 18x$ et $x \in \mathbb{R}$

$$\Leftrightarrow 7x^2 - 18x + 11 = 0$$

$$\Leftrightarrow 7x^2 - 7x - 11x + 11 = 0$$

$$\Leftrightarrow 7x(x-1) - 11(x-1) = 0$$

$$\Leftrightarrow (x-1)(7x-11) = 0 \Leftrightarrow x \in \left\{ 1; \frac{11}{7} \right\}$$

$$\begin{cases} m+n = -18 \\ m \cdot n = 7 \cdot 11 \end{cases} \Leftrightarrow \begin{cases} m = -7 \\ n = -11 \end{cases}$$

9) $7x^2 - 14x - 56 = 0$ et $x \in \mathbb{R}$

$$\Leftrightarrow 7(x^2 - 2x - 8) = 0 \quad \text{): } 7$$

$$\Leftrightarrow x^2 - 2x - 8 = 0$$

$$\Leftrightarrow (x-4)(x+2) = 0$$

$$\Leftrightarrow x \in \{4; -2\}$$

$$\begin{cases} m+n = -2 \\ m \cdot n = -8 \end{cases} \Leftrightarrow \begin{cases} m = -4 \\ n = +2 \end{cases}$$

10) $6x^2 - 13x + 6 = 0$ et $x \in \mathbb{R}$

$$\Leftrightarrow 6x^2 - 9x - 4x + 6 = 0$$

$$\Leftrightarrow 3x(2x-3) - 2(2x-3) = 0$$

$$\Leftrightarrow (2x-3)(3x-2) = 0$$

$$\Leftrightarrow x \in \left\{ \frac{3}{2}; \frac{2}{3} \right\}$$

$$\begin{cases} m+n = -13 \\ m \cdot n = 6 \cdot 6 = 36 \end{cases}$$

$$\Leftrightarrow \begin{cases} m = -9 \\ n = -4 \end{cases}$$

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