

## Exercice 1

\* IR : Identité remarquable. (1)

$$- A = 9x^2 - 6x + 1 = (3x)^2 - (2 \times 3x \times 1) + (1)^2 = \underline{(3x-1)^2} \quad (2^e \text{ IR})$$

$$- B = x^2 - 100 = x^2 - 10^2 = \underline{(x-10)(x+10)} \quad (3^e \text{ IR})$$

$$- C = 9 + 16x^2 > 0, \quad \underline{\text{cette expression n'est pas factorisable.}}$$

$$- D = 36x^2 + 84x + 49 = (6x)^2 + (2 \times 6x \times 7) + (7)^2 = \underline{(6x+7)^2} \quad (1^e \text{ IR})$$

$$- E = 64x^2 + 81x + 25 = 64x^2 + 80x + 25 + x = (8x+5)^2 + x$$

E n'est pas une identité remarquable, donc E n'est pas factorisable au niveau Troisième.

$$- F = 5x^3 - 20x^2 + 20x = (5x \times x^2) - (5x \times 4x) + (5x \times 4)$$

$$\Leftrightarrow F = 5x [x^2 - 4x + 4] = 5x \times \underbrace{(x^2 - (2 \times 2x) + 2^2)}_{2^e \text{ IR}} = \underline{5x(x-2)^2}$$

## Exercice 2

$$- A = (2x-7)(4x^2-3x) = (2x \times 4x^2) - (2x \times 3x) - (7 \times 4x^2) - 7 \times (-3x)$$

$$\Leftrightarrow -A = 8x^3 - 6x^2 - 28x^2 + 21x = \underline{8x^3 - 34x^2 + 21x}$$

$$- B = (2x-3)^2 = (2x)^2 - (3 \times 2x \times 2) + (3)^2 = \underline{4x^2 - 12x + 9}$$

$$- C = (3x+5)^2 - 2x(x-4) = (3x)^2 + (2 \times 3x \times 5) + 5^2 - 2x^2 + 8x$$

$$\Leftrightarrow C = 9x^2 + 30x + 25 - 2x^2 + 8x = \underline{7x^2 + 38x + 25}$$

$$- D = (4x-3)(4x+3) - (2x+1)(2x-1) = (4x)^2 - (3)^2 - ((2x)^2 - (1)^2)$$

$$\Leftrightarrow D = 16x^2 - 9 - (4x^2 - 1) = 16x^2 - 9 - 4x^2 + 1 = \underline{12x^2 - 8}$$

Exercice 3

$$A = 23^2 - 17^2 = (23+17)(23-17) = 40 \times 6 = \underline{\underline{240}}$$

$$B = (4,25)^2 - 2 \times (4,25) \times 0,25 + 0,25^2 = (4,25 - 0,25)^2 = 4^2 = \underline{\underline{16}}$$

$$C = 199^2 = (200-1)^2 = 200^2 - 2 \times 200 \times 1 + 1^2 = 40000 - 400 + 1$$

$$\Leftrightarrow C = \underline{\underline{39601}}$$

Exercice 4

$$A = -2(4x^2 - 25) + (2x-5)(3x+7)$$

$$1) A = -8x^2 + 50 + 6x^2 + 14x - 15x - 35$$

$$\Leftrightarrow A = \underline{\underline{-2x^2 - x + 15}}$$

$$2) a) B = 4x^2 - 25 = (2x)^2 - 5^2 = (2x-5)(2x+5)$$

$$b) A = -2(4x^2 - 25) + (2x-5)(3x+7)$$

$$\Leftrightarrow A = -2(2x-5)(2x+5) + (2x-5)(3x+7)$$

$$\Leftrightarrow A = (2x-5)[-2(2x+5) + (3x+7)] = (2x-5)(-4x-10+3x+7)$$

$$\Leftrightarrow A = \underline{\underline{(2x-5)(-x-3)}}$$

$$3) a) \text{ si } x=0 \quad A = -2 \times 0 - 0 + 15 = \underline{\underline{15}}$$

$$b) \text{ si } x = -1/3 \quad A = \left(-\frac{2 \times 1}{3} - 5\right) \left(+\frac{1}{3} - 3\right) = \left(\frac{-2-15}{3}\right) \times \left(\frac{+1-9}{3}\right)$$

$$\Leftrightarrow A = \left(\frac{-17}{3}\right) \times \left(\frac{-8}{3}\right) = \boxed{\frac{136}{9}} = \boxed{\frac{136}{9}}$$

Exercice 5

$- 5x^2 - 6x = 0$

$\Leftrightarrow x(5x - 6) = 0 \Leftrightarrow x = 0 \text{ ou } 5x - 6 = 0$

$\Leftrightarrow x = 0 \text{ ou } 5x = 6 \Leftrightarrow \boxed{x = 0 \text{ ou } x = 6/5}$

Donc  $S = \{ 0 ; 6/5 \}$

$- 4x^2 - 4x + 1 = 0$

$\Leftrightarrow (2x)^2 - (2 \times 2x + 1) + 1^2 = 0 \Leftrightarrow (2x - 1)^2 = 0 \Leftrightarrow 2x - 1 = 0$

$\Leftrightarrow 2x = 1 \Leftrightarrow \boxed{x = 1/2}$

Donc  $S = \{ 1/2 \}$

$- 16x^2 - 9 = 0$

$\Leftrightarrow (4x)^2 - (3)^2 = 0 \Leftrightarrow (4x - 3)(4x + 3) = 0 \Leftrightarrow 4x - 3 = 0 \text{ ou } 4x + 3 = 0$

$\Leftrightarrow 4x = 3 \text{ ou } 4x = -3 \Leftrightarrow \boxed{x = 3/4 \text{ ou } x = -3/4}$

Donc  $S = \{ -3/4 ; 3/4 \}$

$- 25x^2 = 20x - 4$

$\Leftrightarrow 25x^2 - 20x + 4 = 0 \Leftrightarrow (5x)^2 - (2 \times 5x \times 2) + 2^2 = 0$

$\Leftrightarrow (5x - 2)^2 = 0 \Leftrightarrow 5x - 2 = 0 \Leftrightarrow 5x = 2 \Leftrightarrow \boxed{x = 2/5}$

Donc  $S = \{ 2/5 \}$

$- (2x - 6)^2 = 4 \Leftrightarrow (2x - 6)^2 - 4 = 0 \Leftrightarrow (2x - 6)^2 - 2^2 = 0$

$\Leftrightarrow ((2x - 6) - 2)((2x - 6) + 2) = 0 \Leftrightarrow (2x - 6 - 2)(2x - 6 + 2) = 0$

$\Leftrightarrow (2x - 8)(2x - 4) = 0 \Leftrightarrow 2x - 8 = 0 \text{ ou } 2x - 4 = 0 \quad (1)$

$$(1) \Leftrightarrow 2x = 8 \quad \text{ou} \quad 2x = 4$$

$$\Leftrightarrow x = 4 \quad \text{ou} \quad x = 2$$

$$\text{Donc } S = \{ 2; 4 \}$$

$$-(3x+7)(3x+5) = 0$$

$$\Leftrightarrow 3x+7=0 \quad \text{ou} \quad 3x+5=0 \quad \Leftrightarrow 3x=-7 \quad \text{ou} \quad 3x=-5$$

$$\Leftrightarrow x = -7/3 \quad \text{ou} \quad x = -5/3$$

$$\text{Donc } S = \left\{ -7/3; -5/3 \right\}$$