

EXERCICE 1 :

Développer et réduire :

$$A = 3x(2x + 5)$$

$$B = -y(6 - y)$$

$$C = (4t + 2)(3t + 7)$$

$$D = (2x - 3)(x + 5)$$

$$E = (4 + z)^2$$

$$F = (1 - 3t)^2$$

$$G = (7y - 5)(7y + 5)$$

EXERCICE 2 :

Supprimer les parenthèses et réduire :

$$A = 1 - [1 - (1 + x)]$$

$$B = 2y - [-2y + (3y - 2)]$$

EXERCICE 3 :

Factoriser :

$$A = x(x + 4) + x(2x - 3)$$

$$B = (2y - 3)(5y - 3) - (2y - 3)(7y - 8)$$

$$C = (z - 2) - (z - 2)(3z - 4)$$

$$D = 49 - z^2$$

$$E = (x + 1)^2 - 16$$

$$F = 4t^2 - (t + 1)^2$$

$$G = x^2 + 2x + 1$$

$$H = 9 - 6y + y^2$$

$$I = t^2 - 18t + 81$$

$$J = 16x^2 + 8x + 1$$

EXERCICE 4 :

Calculer à l'aide d'une identité remarquable :

$$42 \times 38$$

$$59^2$$

$$41^2$$

$$17^2 - 15^2$$

$$30,4^2 - 2 \times 30,4 \times 0,4 + 0,4^2$$

EXERCICE 5 :

Compléter pour que les égalités soient vraies, pour toutes les valeurs de x :

1) $(x + \dots)^2 = \dots + 6x + \dots$

2) $(\dots - \dots)^2 = 4x^2 \dots + 25$

3) $\dots - 64 = (7x - \dots)(\dots + \dots)$

EXERCICE 6 :

$$D = (2x + 3)^2 + (2x + 3)(7x - 2)$$

- 1) Développer et réduire D.
- 2) Factoriser D.
- 3) Calculer D pour $x = -4$ puis pour $x = \frac{1}{4}$

EXERCICE 1 :

$$A = 3x(2x + 5) = \mathbf{6x^2 + 15x}$$

$$B = -y(6 - y) = \mathbf{-6y + y^2}$$

$$C = (4t + 2)(3t + 7) = 12t^2 + 28t + 6t + 14 = \mathbf{12t^2 + 34t + 14}$$

$$D = (2x - 3)(x + 5) = 2x^2 + 10x - 3x - 15 = \mathbf{2x^2 + 7x - 15}$$

$$E = (4 + z)^2 = 4^2 + 2 \times 4 \times z + z^2 = \mathbf{16 + 8z + z^2}$$

$$F = (1 - 3t)^2 = 1^2 - 2 \times 1 \times 3t + (3t)^2 = \mathbf{1 - 6t + 9t^2}$$

$$G = (7y - 5)(7y + 5) = (7y)^2 - 5^2 = \mathbf{49y^2 - 25}$$

EXERCICE 2 :

$$A = 1 - [1 - (1 + x)] = 1 - (1 - 1 - x) = 1 - (-x) = \mathbf{1 + x}$$

$$B = 2y - [-2y + (3y - 2)] = 2y - (-2y + 3y - 2) = 2y - (y - 2) = 2y - y + 2 = \mathbf{y + 2}$$

EXERCICE 3 :

$$A = \mathbf{x(x + 4) + x(2x - 3) = x[(x + 4) + (2x - 3)] = x(3x + 1)}$$

$$\begin{aligned} B &= \mathbf{(2y - 3)(5y - 3) - (2y - 3)(7y - 8) = (2y - 3)[(5y - 3) - (7y - 8)]} \\ &= (2y - 3)(5y - 3 - 7y + 8) \\ &= \mathbf{(2y - 3)(5 - 2y)} \end{aligned}$$

$$\begin{aligned} C &= (z - 2) - (z - 2)(3z - 4) = \mathbf{(z - 2) \times 1 - (z - 2)(3z - 4)} \\ &= \mathbf{(z - 2)[1 - (3z - 4)]} \\ &= (z - 2)(1 - 3z + 4) \\ &= \mathbf{(z - 2)(5 - 3z)} \end{aligned}$$

$$D = 49 - z^2 = 7^2 - z^2 = \mathbf{(7 - z)(7 + z)}$$

$$\begin{aligned} E &= (x + 1)^2 - 16 = (x + 1)^2 - 4^2 = [(x + 1) - 4][(x + 1) + 4] \\ &= \mathbf{(x - 3)(x + 5)} \end{aligned}$$

$$\begin{aligned} F &= 4t^2 - (t + 1)^2 = (2t)^2 - (t + 1)^2 = [(2t) - (t + 1)][(2t) + (t + 1)] \\ &= (2t - t - 1)(2t + t + 1) \\ &= \mathbf{(t - 1)(3t + 1)} \end{aligned}$$

$$G = x^2 + 2x + 1 = x^2 + 2 \times x \times 1 + 1^2 = \mathbf{(x + 1)^2}$$

$$H = 9 - 6y + y^2 = 3^2 - 2 \times 3 \times y + y^2 = \mathbf{(3 - y)^2}$$

$$I = t^2 - 18t + 81 = t^2 - 2 \times t \times 9 + 9^2 = \mathbf{(t - 9)^2}$$

$$J = 16x^2 + 8x + 1 = (4x)^2 + 2 \times 4x \times 1 + 1^2 = \mathbf{(4x + 1)^2}$$

EXERCICE 4 :

$$42 \times 38 = (40 + 2)(40 - 2) = 40^2 - 2^2 = 1600 - 4 = \mathbf{1596}$$

$$59^2 = (60 - 1)^2 = 60^2 - 2 \times 60 \times 1 + 1^2 = 3600 - 120 + 1 = \mathbf{3481}$$

$$41^2 = (40 + 1)^2 = 40^2 + 2 \times 40 \times 1 + 1^2 = 1600 + 80 + 1 = \mathbf{1681}$$

$$17^2 - 15^2 = (17 - 15)(17 + 15) = 2 \times 32 = \mathbf{64}$$

$$30,4^2 - 2 \times 30,4 \times 0,4 + 0,4^2 = (30,4 - 0,4)^2 = 30^2 = \mathbf{900}$$

EXERCICE 5 :

$$1) \quad (x + \mathbf{3})^2 = \mathbf{x^2} + 6x + \mathbf{9}$$

$$2) \quad (\mathbf{2x - 5})^2 = 4x^2 - \mathbf{20x} + 25$$

$$3) \quad \mathbf{49x^2} - 64 = (7x - \mathbf{8})(\mathbf{7x + 8})$$

EXERCICE 6 :

$$\begin{aligned} 1) \quad D &= (2x + 3)^2 + (2x + 3)(7x - 2) \\ &= [(2x)^2 + 2 \times 2x \times 3 + 3^2] + (14x^2 - 4x + 21x - 6) \\ &= 4x^2 + 12x + 9 + 14x^2 - 4x + 21x - 6 \\ &= \mathbf{18x^2 + 29x + 3} \end{aligned}$$

$$\begin{aligned} 2) \quad D &= (2x + 3)^2 + (2x + 3)(7x - 2) \\ &= (2x + 3)(2x + 3) + (2x + 3)(7x - 2) \\ &= (2x + 3)[(2x + 3) + (7x - 2)] \\ &= \mathbf{(2x + 3)(9x + 1)} \end{aligned}$$

$$\begin{aligned} 3) \quad \text{si } x = -4 \text{ alors } D &= 18 \times (-4)^2 + 29 \times (-4) + 3 = 18 \times 16 - 29 \times 4 + 3 \\ &= 288 - 116 + 3 = \mathbf{175} \end{aligned}$$

$$\text{Si } x = \frac{1}{4} \text{ alors } D = \left(2 \times \frac{1}{4} + 3\right) \left(9 \times \frac{1}{4} + 1\right) = \left(\frac{1}{2} + \frac{6}{2}\right) \left(\frac{9}{4} + \frac{4}{4}\right) = \frac{7}{2} \times \frac{13}{4} = \mathbf{\frac{91}{8}}$$