

Exercices de développement – Correction

EXERCICE 1 : Développer et réduire au maximum les expressions suivantes :

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|--|-----------------------------|
| 1) $3(x+2) = 3x+6$ | 2) $-5(2x-7) = -10x+35$ |
| 3) $3x(6-x) = 18x-3x^2 = -3x^2+18x$ | 4) $-2t(t+5) = -2t^2-10t$ |
| 5) $(x+2)(3x-5) = 3x^2-5x+6x-10 = 3x^2+x-10$ | 6) $(3x+1)^2 = 9x^2+6x+1$ |
| 7) $(2t-5)^2 = 4t^2-20t+25$ | 8) $(4x+3)(4x-3) = 16x^2-9$ |

EXERCICE 2 : Développer et réduire au maximum les expressions suivantes :

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|---|---|
| 1) $3(5x+7) = 15x+21$ | 2) $(3x+2)^2 = 9x^2+12x+4$ |
| 3) $(3x-7)(x+8) = 3x^2+24x-7x-56 = 3x^2+17x-56$ | 4) $2x(4-x) = 8x-2x^2 = -2x^2+8x$ |
| 5) $-4(9x-1) = -36x+4$ | 6) $(8x-4)^2 = 64x^2-64x+16$ |
| 7) $(4x-1)(4x+1) = 16x^2-1$ | 8) $(3-2x)(x-4) = 3x-12-2x^2+8x = -2x^2+11x-12$ |
| 9) $(2t-1)^2 = 4t^2-4t+1$ | 10) $(7-2t)(7+2t) = 49-4t^2 = -4t^2+49$ |

EXERCICE 3 : Développer et réduire au maximum les expressions suivantes :

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|-------------------------------|-------------------------------|
| 1) $2x+1-(5x+3) =$ | 2) $2(x-3)-5(1-4x) =$ |
| 3) $5(x-7)-8(x+1) =$ | 4) $3(2t+1)+8(4-3t) =$ |
| 5) $4(x+5)^2 =$ | 6) $2(7x-4)^2 =$ |
| 7) $3(2x+8)(3x-2) =$ | 8) $7(x-1)-(x+3)(x+1) =$ |
| 9) $(x-1)(2x-5)+(x+2)(x-2) =$ | 10) $2(x-1)^2+3(2x+1)(x-5) =$ |
| 11) $(x-5)^2+(2x-3)^2 =$ | 12) $3(x+5)^2-(2x-3)^2 =$ |
| 13) $2(x-1)^2-(3x+2)^2 =$ | 14) $3(2x-5)^2-8(x+2)^2 =$ |

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

$$2) 2(x-3)-5(1-4x) = 2x-6-5+20x \\ = 22x-11$$

$$3) 5(x-7)-8(x+1) = 5x-35-8x-8 \\ = -3x-43$$

$$4) 3(2t+1)+8(4-3t) = 6t+3+32-24t \\ = -18t+35$$

$$5) 4(x+5)^2 = 4(x^2+10x+25) \\ = 4x^2+40x+100$$

$$6) 2(7x-4)^2 = 2(49x^2-56x+16) \\ = 98x^2-112x+32$$

$$7) 3(2x+8)(3x-2) = 3(6x^2-4x+24x-16) \\ = 3(6x^2+20x-16) \\ = 18x^2+60x-48$$

$$8) 7(x-1)-(x+3)(x+1) = 7x-7-(x^2+x+3x+3) \\ = 7x-7-(x^2+4x+3) \\ = 7x-7-x^2-4x-3 \\ = -x^2+3x-10$$

$$9)(x-1)(2x-5) + (x+2)(x-2) = 2x^2 - 5x - 2x + 5 + x^2 - 4 \\ = 3x^2 - 7x + 1$$

$$10)2(x-1)^2 + 3(2x+1)(x-5) \\ = 2(x^2 - 2x + 1) + 3(2x^2 - 10x + x - 5) \\ = 2x^2 - 4x + 2 + 6x^2 - 30x + 3x - 15 \\ = 8x^2 - 31x - 13$$

$$11)(x-5)^2 + (2x-3)^2 = x^2 - 10x + 25 + 4x^2 - 12x + 9 \\ = 5x^2 - 22x + 34$$

$$12)3(x+5)^2 - (2x-3)^2 \\ = 3(x^2 + 10x + 25) - (4x^2 - 12x + 9) \\ = 3x^2 + 30x + 75 - 4x^2 + 12x - 9 \\ = -x^2 + 42x + 66$$

$$13)2(x-1)^2 - (3x+2)^2 = 2(x^2 - 2x + 1) - (9x^2 + 12x + 4) \\ = 2x^2 - 4x + 2 - 9x^2 - 12x - 4 \\ = -7x^2 - 16x - 2$$

$$14)3(2x-5)^2 - 8(x+2)^2 \\ = 3(4x^2 - 20x + 25) - 8(x^2 + 4x + 4) \\ = 12x^2 - 60x + 75 - 8x^2 - 32x - 32 \\ = 4x^2 - 92x + 43$$

EXERCICE 4 : Développer et réduire au maximum les expressions suivantes :

$$1) \frac{3}{4}(2x-3) =$$

$$2) \left(x + \frac{2}{7}\right)^2 =$$

$$3) \left(3x + \frac{1}{2}\right)\left(x - \frac{3}{4}\right) =$$

$$4) 3\left(\frac{3}{5}x + 2\right) =$$

$$5) \left(2x + \frac{3}{2}\right)^2 + \left(2x + \frac{3}{2}\right)\left(2x - \frac{3}{2}\right) =$$

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

$$1) \frac{3}{4}(2x-3) = \frac{3}{2}x - \frac{9}{4}$$

$$2) \left(x + \frac{2}{7}\right)^2 = x^2 + \frac{4}{7}x + \frac{4}{49}$$

$$3) \left(3x + \frac{1}{2}\right)\left(x - \frac{3}{4}\right) = 3x^2 - \frac{9}{4}x + \frac{1}{2}x - \frac{3}{8} \\ = 3x^2 - \frac{7}{4}x - \frac{3}{8}$$

$$4) 3\left(\frac{3}{5}x + 2\right) = \frac{9}{5}x + 6$$

$$5) \left(2x + \frac{3}{2}\right)^2 + \left(2x + \frac{3}{2}\right)\left(2x - \frac{3}{2}\right) = 4x^2 + 6x + \frac{9}{4} + 4x^2 - \frac{9}{4} \\ = 8x^2 + 6x$$

$$\begin{aligned}
6) \frac{1}{2}(4x-3)^2 - \frac{3}{4}(2x+1)^2 &= 4x^2 + 6x + \frac{9}{4} + 4x^2 - \frac{9}{4} \\
&= \frac{1}{2}(16x^2 - 24x + 9) - \frac{3}{4}(4x^2 + 4x + 1) \\
&= 8x^2 - 12x + \frac{9}{2} - 3x^2 - 3x - \frac{3}{4} \\
&= 5x^2 - 15x + \frac{15}{4}
\end{aligned}$$

EXERCICE 5 : On considère la fonction $f(x)$ définie sur $\mathbb{R}$ par $f(x) = 4(x-2)(x+4)$.

1) Développer l'expression de $f(x)$.

2) Démontrer que $f(x) = 4(x+1)^2 - 36$.

3) En utilisant la forme de $f(x)$ la plus adaptée, calculer les images de :

a) 0

b) -4

c) -1

d) 2

e) 3