

Exercice 1.25 Développer

a) $(x + 2)^2 = x^2 + 4x + 4$

i) $(5x - 2y)^2 = 25x^2 - 20xy + 4y^2$

b) $(2x + 3)^2 = 4x^2 + 12x + 9$

j) $(11x - 3y)^2 = 121x^2 - 66xy + 9y^2$

c) $(5x - 2)^2 = 25x^2 - 20x + 4$

k) $(10x + y)(10x - y) = 100x^2 - y^2$

d) $(4x - 3)^2 = 16x^2 - 24x + 9$

l) $(8x + 5y)(8x - 5y) = 64x^2 - 25y^2$

e) $(x + 2)(x - 2) = x^2 - 4$

m) $(x^2 + 2y)(x^2 - 2y) = x^4 - 4y^2$

f) $(6x + 7)(6x - 7) = 36x^2 - 49$

n) $(2x^2 + 3y^3)^2 = 4x^4 + 12x^2y^3 + 9y^6$

g) $(x + 2y)^2 = x^2 + 4xy + 4y^2$

o) $(4x^2y - 3xy^2)^2 = 16x^4y^2 - 24x^3y^3 + 9x^2y^4$

h) $(3x + 4y)^2 = 9x^2 + 24xy + 16y^2$

p) $(6x^4 + 5ay^3)^2 = 36x^8 + 60ax^4y^3 + 25a^2y^6$

Exercice 1.26 Développer

a) $(x + 3)^3 = x^3 + 3 \cdot x^2 \cdot 3 + 3 \cdot x \cdot 9 + 27$
 $= \underline{x^3 + 9x^2 + 27x + 27}$

b) $(x - 2)^3 = x^3 - 3 \cdot x^2 \cdot 2 + 3 \cdot x \cdot 4 - 8$
 $= \underline{x^3 - 6x^2 + 12x - 8}$

c) $(x + 3y)^3 = x^3 + 3 \cdot x^2 \cdot 3y + 3 \cdot x \cdot 9y^2 + 27y^3$
 $= \underline{x^3 + 9x^2y + 27xy^2 + 27y^3}$

$$\begin{aligned} \text{d) } (3x - 4y)^3 &= 27x^3 - 3 \cdot 9x^2 \cdot 4y + 3 \cdot 3x \cdot 16y^2 - 64y^3 \\ &= \underline{27x^3 - 108x^2y + 144xy^2 - 64y^3} \end{aligned}$$

$$\begin{aligned} \text{e) } (2x^2 - 3y^5)^3 &= 8x^6 - 3 \cdot 4x^4 \cdot 3y^5 + 3 \cdot 2x^2 \cdot 9y^{10} - 27y^{15} \\ &= \underline{8x^6 - 36x^4y^5 + 54x^2y^{10} - 27y^{15}} \end{aligned}$$

$$\begin{aligned} \text{f) } (3x^2y + 4y^2)^3 &= \overset{A^3}{27x^6y^3} + \overset{3 \cdot A^2 \cdot B}{3 \cdot 9x^4y^2 \cdot 4y^2} + \overset{3 \cdot A \cdot B^2}{3 \cdot 3x^2y \cdot 16y^4} + \overset{B^3}{64y^6} \\ &= \underline{27x^6y^3 + 108x^4y^4 + 144x^2y^5 + 64y^6} \end{aligned}$$

$$\text{g) } (2x - 3)(4x^2 + 6x + 9) = \underline{8x^3 - 27}$$

$$\text{h) } (3x + 2y^2)(9x^2 - 6xy^2 + 4y^4) = \underline{27x^3 + 8y^6}$$

Exercice 1.27 Développer et réduire

$$\begin{aligned} \text{a) } (x + 4)^2 - (x - 4)^2 &= x^2 + 8x + 16 - (x^2 - 8x + 16) \\ &= x^2 + 8x + 16 - x^2 + 8x - 16 = \underline{16x} \end{aligned}$$

$$\begin{aligned} \text{b) } (3x + 3y)^2 - 3(x + y)^2 &= 9x^2 + 18xy + 9y^2 - 3(x^2 + 2xy + y^2) \\ &= 9x^2 + 18xy + 9y^2 - 3x^2 - 6xy - 3y^2 = \underline{6x^2 + 12xy + 6y^2} \end{aligned}$$

$$\begin{aligned} \text{c) } (7x - 4)^2 - (3x + 5)(3x - 5) &= 49x^2 - 56x + 16 - (9x^2 - 25) \\ &= 49x^2 - 56x + 16 - 9x^2 + 25 = \underline{40x^2 - 56x + 41} \end{aligned}$$

$$\text{d) } (x - 2)(x^2 + 4)(x + 2) = (x - 2)(x + 2)(x^2 + 4) = (x^2 - 4)(x^2 + 4) = \underline{x^4 - 16}$$

$$\begin{aligned} \text{e) } (x - 3y)^3 - (3x - y)^3 + 26(x + y)(x^2 - xy + y^2) &= \\ &= \underline{x^3 - 9x^2y + 27xy^2 - 27y^3} - \underline{(27x^3 - 27x^2y + 9xy^2 - y^3)} + \underline{26(x^3 + y^3)} \\ &= x^3 - 9x^2y + 27xy^2 - 27y^3 - 27x^3 + 27x^2y - 9xy^2 + y^3 + 26x^3 + 26y^3 \\ &= \underline{18x^2y + 18xy^2} \end{aligned}$$