

Correctif : Exercices mélangés et plus difficiles sur les produits remarquables

1. $(2a - 1)^2 + (2a + 1)^2 = 4a^2 + 1 - 4a + 4a^2 + 1 + 4a = 8a^2 + 2$
2. $-4x(x^3 - 5y) + (2x^2 - 3y)^2 = -4x^4 + 20xy + 4x^4 + 9y^2 - 12x^2y = 9y^2 - 12x^2y + 20xy$
3. $(3 - 2x^3)(3 + 2x^3) + 2x^2(x^2 - 1)^2 = 9 - 4x^6 + 2x^2(x^4 + 1 - 2x^2) = 9 - 4x^6 + 2x^6 + 2x^2 - 4x^4 = 9 - 2x^6 + 2x^2 - 4x^4$
4. $(5x - 4)(4 + 5x) + (-2x - 7)(-2x + 7) = (5x - 4)(5x + 4) + (-2x - 7)(-2x + 7) = 25x^2 - 16 + 4x^2 - 49 = 29x^2 - 65$
5. $(x^2 - 4)(y^2 + 5) + (2x - 3y)^2 = x^2y^2 + 5x^2 - 4y^2 - 20 + 4x^2 + 9y^2 - 12xy = 9x^2 + 5y^2 + x^2y^2 - 12xy - 20$
6. $(2x - 1)^2 + (5x + 2)^2 + (4x - 3)(4x + 3) = 4x^2 + 1 - 4x + 25x^2 + 4 + 20x + 16x^2 - 9 = 45x^2 + 16x - 4$
7. $(-7x - 2)^2 - 5x(7x - 4) + 2(-4x - 1)(-4x + 1) = 49x^2 + 4 + 28x - 35x^2 + 20x + 2(16x^2 - 1) = 49x^2 + 4 + 28x - 35x^2 + 20x + 32x^2 - 2 = 46x^2 + 48x + 2$
8. $7x^2 - 5x - (2x - 3)^2 = 7x^2 - 5x - (4x^2 + 9 - 12x) = 7x^2 - 5x - 4x^2 - 9 + 12x = 3x^2 + 7x - 9$
9. $(a + 1)^2 - (a + 1)(a - 1) = a^2 + 1 + 2a - (a^2 - 1) = a^2 + 1 + 2a - a^2 + 1 = 2a + 2$
10. $-(-2x - 3y)^2 - (2y - 3x)(2y + 3x) = -(4x^2 + 9y^2 - 12xy) - (4y^2 - 9x^2) = -4x^2 - 9y^2 + 12xy - 4y^2 + 9x^2 = 5x^2 - 13y^2 + 12xy$
11. $\left(\frac{1}{2}a - \frac{1}{3}b\right)^2 + \left(\frac{1}{3}a + \frac{1}{2}b\right)^2 = \frac{a^2}{4} + \frac{b^2}{9} - \frac{ab}{3} + \frac{a^2}{9} + \frac{b^2}{4} + \frac{ab}{3} = \frac{9a^2}{36} + \frac{4b^2}{36} + \frac{4a^2}{36} + \frac{9b^2}{36} = \frac{13a^2}{36} + \frac{13b^2}{36}$
12. $-5\left(\frac{3}{5}x^2 - \frac{1}{10}\right) + \left(\frac{1}{5}x + \frac{3}{2}\right)\left(\frac{1}{5}x - \frac{3}{2}\right) = \frac{-15}{5}x^2 + \frac{5}{10} + \frac{1}{25}x^2 - \frac{9}{4} = \frac{-75}{25}x^2 + \frac{2}{4} + \frac{1}{25}x^2 - \frac{9}{4} = \frac{-74}{25}x^2 - \frac{7}{4}$
13. $\left(\frac{x}{4} - 2\right)\left(2 + \frac{x}{4}\right) + \left(\frac{x}{2} + 1\right)\left(\frac{x}{2} - 1\right) = \left(\frac{x}{4} - 2\right)\left(\frac{x}{4} + 2\right) + \left(\frac{x}{2} + 1\right)\left(\frac{x}{2} - 1\right) = \frac{x^2}{16} - 4 + \frac{x^2}{4} - 1 = \frac{x^2}{16} + \frac{4x^2}{16} - 5 = \frac{5x^2}{16} - 5$
14. $\left(a - \frac{3}{5}\right)\left(a - \frac{2}{5}\right) - \frac{4}{5}a\left(\frac{a}{2} - 1\right) = a^2 - \frac{2}{5}a - \frac{3}{5}a + \frac{6}{25} - \frac{2}{5}a^2 + \frac{4}{5}a = \frac{5}{5}a^2 - \frac{2}{5}a^2 - \frac{a}{5} + \frac{6}{25} = \frac{3}{5}a^2 - \frac{a}{5} + \frac{6}{25}$