

Semaine 2 : Factoriser en utilisant les produits remarquables :

$$1. 16a^2 - 25y^2 = (4a - 5y)(4a + 5y)$$

$$2. x^2y^2z^2 - p^2 = (xyz - p)(xyz + p)$$

$$3. \frac{x^2}{4} - \frac{y^2}{25} = \left(\frac{x}{2} - \frac{y}{5}\right)\left(\frac{x}{2} + \frac{y}{5}\right)$$

$$4. a^3 - 4a^9 = 100a^2 + 9b^6 - 60ab^3 = (10a - 3b^3)^2$$

$$5. (a - 1)^2 - 1 = (a - 1 - 1)(a - 1 + 1) \\ = a(a - 2)$$

$$6. a^4 - 2a^2 + 1 = (a^2 - 1)^2 \\ = (a - 1)^2(a + 1)^2$$

$$7. 81a^4 - 169 = (9a^2 - 13)(9a^2 + 13)$$

$$8. \left(5x - \frac{3}{2}\right)^2 - \frac{81}{4} = \left(5x - \frac{3}{2} - \frac{9}{2}\right)\left(5x - \frac{3}{2} + \frac{9}{2}\right) \\ = (5x - 6)(5x + 3)$$

$$9. 25x^5y - 49xy^3 = 25a^2 - (b-2a)^2 = [5a - (b-2a)] \dots \\ \dots [5a + (b-2a)] \\ = (3a - b)(3a + b)$$

$$10. \frac{a^2}{4} + \frac{1}{49} - \frac{a}{7} = \left(\frac{a}{2} - \frac{1}{7} \right)^2$$

$$11. 81x^4 - \frac{1}{16} = \left(9x^2 - \frac{1}{4} \right) \left(9x^2 + \frac{1}{4} \right) \\ = \left(3x - \frac{1}{2} \right) \left(3x + \frac{1}{2} \right) \left(9x^2 + \frac{1}{4} \right)$$

$$12. (a-b)^2 - 121 = (a-b-11)(a-b+11)$$

$$13. a^4 - b^4 = (a^2 - b^2)(a^2 + b^2) \\ = (a-b)(a+b)(a^2 + b^2)$$

$$14. (2x+5)^2 - (3x-2)^2 = [(2x+5) - (3x-2)][(2x+5) + (3x-2)] \\ = (-x+7)(5x+3)$$

$$15. x^4 + 1 - 2x^2 = (x^2 - 1)^2 \\ = (x-1)^2(x+1)^2$$

$$16. \frac{xy}{3} + \frac{y^2}{9} + \frac{x^2}{4} = \left(\frac{x}{2} + \frac{y}{3} \right)^2$$

$$17. 49x^2 - (x-y)^2 = [7x - (x-y)][7x + (x-y)] \\ = (6x+y)(8x-y)$$

$$18. -x^2 + 12x - 36 = x^2 - 12x + 36 = \left(x - \frac{1}{x} \right)^2$$