

RACINES CARREES

EXERCICE 1B

La Providence - Montpellier

CORRIGE - M. QUET

EXERCICE 1 : Calculer :

$$A = (\sqrt{2} + 1)(\sqrt{2} + 3)$$

$$A = \sqrt{2} \times \sqrt{2} + \sqrt{2} \times 3 + 1 \times \sqrt{2} + 1 \times 3$$

$$A = 2 + 3\sqrt{2} + \sqrt{2} + 3$$

$$A = 4\sqrt{2} + 5$$

$$B = (\sqrt{5} + 2)(1 + \sqrt{5})$$

$$B = \sqrt{5} \times 1 + \sqrt{5} \times \sqrt{5} + 3 \times 1 + 2 \times \sqrt{5}$$

$$B = \sqrt{5} + 5 + 3 + 2\sqrt{5}$$

$$B = 3\sqrt{5} + 8$$

$$C = (\sqrt{2} + 1)(\sqrt{2} - 3)$$

$$C = \sqrt{2} \times \sqrt{2} - \sqrt{2} \times 3 + 1 \times \sqrt{2} - 1 \times 3$$

$$C = 2 - 3\sqrt{2} + \sqrt{2} - 3$$

$$C = -2\sqrt{2} - 1$$

$$D = (\sqrt{2} + 1)(\sqrt{2} - 1)$$

$$D = \sqrt{2} \times \sqrt{2} - \sqrt{2} \times 1 + 1 \times \sqrt{2} - 1 \times 1$$

$$D = 2 - \sqrt{2} + \sqrt{2} - 1$$

$$D = 1$$

(identité remarquable)

EXERCICE 2 : Calculer :

$$A = (\sqrt{2} + 1)^2$$

$$A = (\sqrt{2})^2 + 2 \times \sqrt{2} \times 1 + 1^2$$

$$A = 2 + 2\sqrt{2} + 1$$

$$A = 2\sqrt{2} + 3$$

$$B = (\sqrt{3} + 2)^2$$

$$B = (\sqrt{3})^2 + 2 \times \sqrt{3} \times 2 + 2^2$$

$$B = 3 + 4\sqrt{3} + 4$$

$$B = 4\sqrt{3} + 7$$

$$C = (\sqrt{5} - 2)^2$$

$$C = (\sqrt{5})^2 - 2 \times \sqrt{5} \times 2 + 2^2$$

$$C = 5 - 4\sqrt{5} + 4$$

$$C = -4\sqrt{5} + 9$$

$$D = (5 + \sqrt{7})^2$$

$$D = 5^2 + 2 \times 5 \times \sqrt{7} + (\sqrt{7})^2$$

$$D = 25 + 10\sqrt{7} + 7$$

$$D = 10\sqrt{7} + 32$$

EXERCICE 3 : Calculer :

$$A = 3\sqrt{2}(\sqrt{2} + 1)$$

$$A = 3\sqrt{2} \times \sqrt{2} + 3\sqrt{2} \times 1$$

$$A = 3 \times 2 + 3\sqrt{2}$$

$$A = 3\sqrt{2} + 6$$

$$B = (2\sqrt{5} + 2)(1 - 3\sqrt{5})$$

$$B = 2\sqrt{5} \times 1 - 2\sqrt{5} \times 3\sqrt{5} + 2 \times 1 - 2 \times 3\sqrt{5}$$

$$B = 2\sqrt{5} - 6 \times 5 + 2 - 6\sqrt{5}$$

$$B = -4\sqrt{5} - 28$$

$$C = 7\sqrt{3}(3 - 5\sqrt{3})$$

$$C = 7\sqrt{3} \times 3 - 7\sqrt{3} \times 5\sqrt{3}$$

$$C = 21\sqrt{3} - 35 \times 3$$

$$C = 21\sqrt{3} - 105$$

$$D = (5\sqrt{2} - 4)(3 - 8\sqrt{2})$$

$$D = 5\sqrt{2} \times 3 - 5\sqrt{2} \times 8\sqrt{2} - 4 \times 3 + 4 \times 8\sqrt{2}$$

$$D = 15\sqrt{2} - 40 \times 2 - 12 + 32\sqrt{2}$$

$$D = 47\sqrt{2} - 92$$

EXERCICE 4 : Calculer :

$$A = (3\sqrt{2} + 1)^2$$

$$A = (3\sqrt{2})^2 + 2 \times 3\sqrt{2} \times 1 + 1^2$$

$$A = 9 \times 2 + 6\sqrt{2} + 1$$

$$A = 6\sqrt{2} + 19$$

$$B = (2\sqrt{3} + 1)^2$$

$$B = (2\sqrt{3})^2 + 2 \times 2\sqrt{3} \times 1 + 1^2$$

$$B = 4 \times 3 + 4\sqrt{3} + 1$$

$$B = 4\sqrt{3} + 13$$

$$C = (2\sqrt{5} + 3)^2$$

$$C = (2\sqrt{5})^2 + 2 \times 2\sqrt{5} \times 3 + 3^2$$

$$C = 4 \times 5 + 12\sqrt{5} + 9$$

$$C = 12\sqrt{5} + 29$$

$$D = \sqrt{2}(5 + 3\sqrt{2})^2$$

$$D = \sqrt{2} [5^2 + 2 \times 5 \times 3\sqrt{2} + (3\sqrt{2})^2]$$

$$D = \sqrt{2} [25 + 30\sqrt{2} + 9 \times 2]$$

$$D = \sqrt{2} [30\sqrt{2} + 43]$$

$$D = \sqrt{2} \times 30\sqrt{2} + \sqrt{2} \times 43$$

$$D = 30 \times 2 + 43\sqrt{2}$$

$$D = 43\sqrt{2} + 60$$

EXERCICE 5 : Calculer :

$$A = 2\sqrt{3}(7\sqrt{3})^2$$

$$A = 2\sqrt{3} \times (7\sqrt{3} \times 7\sqrt{3})$$

$$A = 2\sqrt{3} \times (7 \times 7 \times \sqrt{3} \times \sqrt{3})$$

$$A = 2\sqrt{3} \times 49 \times 3$$

$$A = 294\sqrt{3}$$

$$B = 3\sqrt{7}(2 - 11\sqrt{7})^2$$

$$B = 3\sqrt{7} [2^2 - 2 \times 2 \times 11\sqrt{7} + (11\sqrt{7})^2]$$

$$B = 3\sqrt{7} [4 - 44\sqrt{7} + 11 \times 11 \times \sqrt{7} \times \sqrt{7}]$$

$$B = 3\sqrt{7} [4 - 44\sqrt{7} + 121 \times 7]$$

$$B = 3\sqrt{7} [4 - 44\sqrt{7} + 847]$$

$$B = 3\sqrt{7} [-44\sqrt{7} + 851]$$

$$B = -3\sqrt{7} \times 44\sqrt{7} + 3\sqrt{7} \times 851$$

$$B = -132 \times 7 + 2553\sqrt{7}$$

$$B = -924 + 2553\sqrt{7}$$

$$C = 2\sqrt{7}(1 - 3\sqrt{7})(2\sqrt{7} - 3)$$

$$C = 2\sqrt{7} [1 \times 2\sqrt{7} - 1 \times 3 - 3\sqrt{7} \times 2\sqrt{7} + 3\sqrt{7} \times 3]$$

$$C = 2\sqrt{7} [2\sqrt{7} - 3 - 6 \times 7 + 9\sqrt{7}]$$

$$C = 2\sqrt{7} [11\sqrt{7} - 45]$$

$$C = 2\sqrt{7} \times 11\sqrt{7} - 2\sqrt{7} \times 45$$

$$C = 22 \times 7 - 90\sqrt{7}$$

$$C = 154 - 90\sqrt{7}$$

EXERCICE 6 : Développer :

$$A = (x + \sqrt{2})^2$$

$$A = x^2 + 2 \times x \times \sqrt{2} + (\sqrt{2})^2$$

$$A = x^2 + 2\sqrt{2}x + 2$$

$$B = (\sqrt{3} - x)^2$$

$$B = (\sqrt{3})^2 - 2 \times \sqrt{3} \times x + x^2$$

$$B = x^2 - 2\sqrt{3}x + 3$$

$$C = (x - 2\sqrt{5})(x + 2\sqrt{5})$$

$$C = x^2 - (2\sqrt{5})^2$$

$$C = x^2 - 2\sqrt{5} \times 2\sqrt{5}$$

$$C = x^2 - 20$$

(identité remarquable)