Notre Dame de La Merci
Montpellier

CORRIGE

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 :

$A = 3\sqrt{2}(\sqrt{2} + 1)$
$A = 3\sqrt{2} \times \sqrt{2} + 3\sqrt{2} \times 1$
$A = 3 \times 2 + 3\sqrt{2}$
$A = 3\sqrt{2} + 6$

$B = (2\sqrt{5} + 2)(1 - 3\sqrt{5})$
$B = 2\sqrt{5} \times 1 - 2\sqrt{5} \times 3\sqrt{5}$
$\qquad + 2 \times 1 - 2 \times 3\sqrt{5}$
$B = 2\sqrt{5} - 6 \times 5 + 2 - 6\sqrt{5}$
$B = -4\sqrt{5} - 28$

$C = 7\sqrt{3}(3 - 5\sqrt{3})$
$C = 7\sqrt{3} \times 3 - 7\sqrt{3} \times 5\sqrt{3}$
$C = 21\sqrt{3} - 35 \times 3$
$C = 21\sqrt{3} - 105$

$D = (5\sqrt{2} - 4)(3 - 8\sqrt{2})$
$D = 5\sqrt{2} \times 3 - 5\sqrt{2} \times 8\sqrt{2}$
$\qquad - 4 \times 3 + 4 \times 8\sqrt{2}$
$D = 15\sqrt{2} - 40 \times 2 - 12 + 32\sqrt{2}$
$D = 47\sqrt{2} - 92$

EXERCICE 4 : Calculer :

$A = (3\sqrt{2} + 1)^2$
$A = (3\sqrt{2})^2 + 2 \times 3\sqrt{2} \times 1 + 1^2$
$A = 9 \times 2 + 6\sqrt{2} + 1$
$A = 6\sqrt{2} + 19$

$B = (2\sqrt{3} + 1)^2$
$B = (2\sqrt{3})^2 + 2 \times 2\sqrt{3} \times 1 + 1^2$
$B = 4 \times 3 + 4\sqrt{3} + 1$
$B = 4\sqrt{3} + 13$

$C = (2\sqrt{5} + 3)^2$
$C = (2\sqrt{5})^2 + 2 \times 2\sqrt{5} \times 3 + 3^2$
$C = 4 \times 5 + 12\sqrt{5} + 9$
$C = 12\sqrt{5} + 29$

$D = \sqrt{2}(5 + 3\sqrt{2})^2$
$D = \sqrt{2}\,[5^2 + 2 \times 5 \times 3\sqrt{2} + (3\sqrt{2})^2]$
$D = \sqrt{2}\left[25 + 30\sqrt{2} + 9 \times 2\right]$
$D = \sqrt{2}\left[30\sqrt{2} + 43\right]$

$D = \sqrt{2} \times 30\sqrt{2} + \sqrt{2} \times 43$
$D = 30 \times 2 + 43\sqrt{2}$
$D = 43\sqrt{2} + 60$

EXERCICE 5 : Calculer :

$A = 2\sqrt{3}(7\sqrt{3})^2$
$A = 2\sqrt{3} \times (7\sqrt{3} \times 7\sqrt{3})$
$A = 2\sqrt{3} \times (7 \times 7 \times \sqrt{3} \times \sqrt{3})$
$A = 2\sqrt{3} \times 49 \times 3$
$A = 294\sqrt{3}$

$B = 3\sqrt{7}(2 - 11\sqrt{7})^2$
$B = 3\sqrt{7}\left[2^2 - 2 \times 2 \times 11\sqrt{7} + (11\sqrt{7})^2\right]$
$B = 3\sqrt{7}\left[4 - 44\sqrt{7} + 11 \times 11 \times \sqrt{7} \times \sqrt{7}\right]$
$B = 3\sqrt{7}\left[4 - 44\sqrt{7} + 121 \times 7\right]$
$B = 3\sqrt{7}\left[4 - 44\sqrt{7} + 847\right]$
$B = 3\sqrt{7}\left[-44\sqrt{7} + 851\right]$
$B = -3\sqrt{7} \times 44\sqrt{7} + 3\sqrt{7} \times 851$
$B = -132 \times 7 + 2553\sqrt{7}$
$B = -924 + 2553\sqrt{7}$

$C = 2\sqrt{7}(1 - 3\sqrt{7})(2\sqrt{7} - 3)$
$C = 2\sqrt{7}\left[1 \times 2\sqrt{7} - 1 \times 3 - 3\sqrt{7} \times 2\sqrt{7} + 3\sqrt{7} \times 3\right]$
$C = 2\sqrt{7}\left[2\sqrt{7} - 3 - 6 \times 7 + 9\sqrt{7}\right]$
$C = 2\sqrt{7}\left[11\sqrt{7} - 45\right]$
$C = 2\sqrt{7} \times 11\sqrt{7} - 2\sqrt{7} \times 45$
$C = 22 \times 7 - 90\sqrt{7}$
$C = 154 - 90\sqrt{7}$

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)

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

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

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