

**Exercice 1 :**

$$A = \sqrt{3} + \sqrt{12} + \sqrt{27}$$

$$A = \sqrt{3} + \sqrt{4 \times 3} + \sqrt{9 \times 3}$$

$$A = \sqrt{3} + \sqrt{4} \times \sqrt{3} + \sqrt{9} \times \sqrt{3}$$

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

$$\boxed{A = 6\sqrt{3}}$$

$$G = \sqrt{28} + \sqrt{63} - \sqrt{700}$$

$$G = \sqrt{4 \times 7} + \sqrt{9 \times 7} - \sqrt{100 \times 7}$$

$$G = \sqrt{4} \times \sqrt{7} + \sqrt{9} \times \sqrt{7} - \sqrt{100} \times \sqrt{7}$$

$$G = 2\sqrt{7} + 3\sqrt{7} - 10\sqrt{7}$$

$$\boxed{G = -5\sqrt{7}}$$

$$B = \sqrt{3} + 3\sqrt{12} + 2\sqrt{27}$$

$$B = \sqrt{3} + 3 \times \sqrt{4 \times 3} + 2 \times \sqrt{9 \times 3}$$

$$B = \sqrt{3} + 3 \times \sqrt{4} \times \sqrt{3} + 2 \times \sqrt{9} \times \sqrt{3}$$

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

$$B = 1\sqrt{3} + 6\sqrt{3} + 6\sqrt{3}$$

$$\boxed{B = 13\sqrt{3}}$$

$$H = 5\sqrt{28} + 4\sqrt{63} - 2\sqrt{700}$$

$$H = 5\sqrt{4 \times 7} + \sqrt{9 \times 7} - \sqrt{100 \times 7}$$

$$H = 5 \times \sqrt{4} \times \sqrt{7} + 4 \times \sqrt{9} \times \sqrt{7} - 2 \times \sqrt{100} \times \sqrt{7}$$

$$H = 5 \times 2 \times \sqrt{7} + 4 \times 3 \times \sqrt{7} - 2 \times 10 \times \sqrt{7}$$

$$H = 10\sqrt{7} + 12\sqrt{7} - 20\sqrt{7}$$

$$\boxed{H = 2\sqrt{7}}$$

$$C = 2\sqrt{3} + 3\sqrt{12} - 7\sqrt{27}$$

$$C = 2\sqrt{3} + 3 \times \sqrt{4 \times 3} - 7 \times \sqrt{9 \times 3}$$

$$C = 2\sqrt{3} + 3 \times \sqrt{4} \times \sqrt{3} - 7 \times \sqrt{9} \times \sqrt{3}$$

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

$$C = 2\sqrt{3} + 6\sqrt{3} - 21\sqrt{3}$$

$$\boxed{C = -13\sqrt{3}}$$

$$I = \sqrt{72} + 3\sqrt{50} - \sqrt{18}$$

$$I = \sqrt{36 \times 2} + 3 \times \sqrt{25 \times 2} - \sqrt{9 \times 2}$$

$$I = \sqrt{36} \times \sqrt{2} + 3 \times \sqrt{25} \times \sqrt{2} - \sqrt{9} \times \sqrt{2}$$

$$I = 6\sqrt{2} + 3 \times 5 \times \sqrt{2} - 3\sqrt{2}$$

$$I = 6\sqrt{2} + 15\sqrt{2} - 3\sqrt{2}$$

$$\boxed{I = 18\sqrt{2}}$$

$$D = \sqrt{5} + 2\sqrt{20} + 3\sqrt{45}$$

$$D = \sqrt{5} + 2 \times \sqrt{4 \times 5} + 3 \times \sqrt{9 \times 5}$$

$$D = \sqrt{5} + 2 \times \sqrt{4} \times \sqrt{5} + 3 \times \sqrt{9} \times \sqrt{5}$$

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

$$D = 1\sqrt{5} + 4\sqrt{5} + 9\sqrt{5}$$

$$\boxed{D = 14\sqrt{5}}$$

$$J = 2\sqrt{32} - \sqrt{128} - 5\sqrt{200}$$

$$J = 2 \times \sqrt{16 \times 2} - \sqrt{64 \times 2} - 5 \times \sqrt{100 \times 2}$$

$$J = 2 \times \sqrt{16} \times \sqrt{2} - \sqrt{64} \times \sqrt{2} - 5 \times \sqrt{100} \times \sqrt{2}$$

$$J = 2 \times 4 \times \sqrt{2} - 8 \times \sqrt{2} - 5 \times 10 \times \sqrt{2}$$

$$J = 8\sqrt{2} - 8\sqrt{2} - 50\sqrt{2}$$

$$\boxed{J = -50\sqrt{2}}$$

$$E = 9\sqrt{5} + 2\sqrt{20} - 5\sqrt{45}$$

$$E = 9\sqrt{5} + 2 \times \sqrt{4 \times 5} - 5 \times \sqrt{9 \times 5}$$

$$E = 9\sqrt{5} + 2 \times \sqrt{4} \times \sqrt{5} - 5 \times \sqrt{9} \times \sqrt{5}$$

$$E = 9\sqrt{5} + 2 \times 2 \times \sqrt{5} - 5 \times 3 \times \sqrt{5}$$

$$E = 9\sqrt{5} + 4\sqrt{5} - 15\sqrt{5}$$

$$\boxed{E = -2\sqrt{5}}$$

$$K = 5\sqrt{99} - 2\sqrt{44} - 3\sqrt{275}$$

$$K = 5 \times \sqrt{9 \times 11} - 2 \times \sqrt{4 \times 11} - 3 \times \sqrt{25 \times 11}$$

$$K = 5 \times \sqrt{9} \times \sqrt{11} - 2 \times \sqrt{4} \times \sqrt{11} - 3 \times \sqrt{25} \times \sqrt{11}$$

$$K = 5 \times 3 \times \sqrt{11} - 2 \times 2 \times \sqrt{11} - 3 \times 5 \times \sqrt{11}$$

$$K = 15\sqrt{11} - 4\sqrt{11} - 15\sqrt{11}$$

$$\boxed{K = -4\sqrt{11}}$$

$$F = -13\sqrt{5} + 3\sqrt{20} - 4\sqrt{45}$$

$$F = -13\sqrt{5} + 3 \times \sqrt{4 \times 5} - 4 \times \sqrt{9 \times 5}$$

$$F = -13\sqrt{5} + 3 \times \sqrt{4} \times \sqrt{5} - 4 \times \sqrt{9} \times \sqrt{5}$$

$$F = -13\sqrt{5} + 3 \times 2 \times \sqrt{5} - 4 \times 3 \times \sqrt{5}$$

$$F = -13\sqrt{5} + 6\sqrt{5} - 12\sqrt{5}$$

$$\boxed{F = -19\sqrt{5}}$$

$$L = -\sqrt{52} + 3\sqrt{13} + 7\sqrt{117}$$

$$L = -\sqrt{4 \times 13} + 3\sqrt{13} + 7 \times \sqrt{9 \times 13}$$

$$L = -\sqrt{4} \times \sqrt{13} + 3\sqrt{13} + 7 \times \sqrt{9} \times \sqrt{13}$$

$$L = -2\sqrt{13} + 3\sqrt{13} + 7 \times 3 \times \sqrt{13}$$

$$L = -2\sqrt{13} + 3\sqrt{13} + 21\sqrt{13}$$

$$\boxed{L = 22\sqrt{13}}$$

### Exercice 2 :

$A = (1 + 4\sqrt{3})^2$ $A = 1^2 + 2 \times 1 \times 4\sqrt{3} + (4\sqrt{3})^2$ $A = 1 + 8\sqrt{3} + 48$ <b><math>A = 49 + 8\sqrt{3}</math></b>	$E = (1 - 4\sqrt{3})^2$ $E = 1^2 - 2 \times 1 \times 4\sqrt{3} + (4\sqrt{3})^2$ $E = 1 - 8\sqrt{3} + 48$ <b><math>E = 49 - 8\sqrt{3}</math></b>	$I = (\sqrt{5} + 1)(\sqrt{5} - 1)$ $I = (\sqrt{5})^2 - 1^2$ $I = 5 - 1$ <b><math>I = 4</math></b>
$B = (2 + 5\sqrt{2})^2$ $B = 2^2 + 2 \times 2 \times 5\sqrt{2} + (5\sqrt{2})^2$ $B = 4 + 20\sqrt{2} + 50$ <b><math>B = 54 + 20\sqrt{2}</math></b>	$F = (2 - 4\sqrt{7})^2$ $F = 2^2 - 2 \times 2 \times 4\sqrt{7} + (4\sqrt{7})^2$ $F = 4 - 16\sqrt{7} + 112$ <b><math>F = 116 - 16\sqrt{7}</math></b>	$J = (2\sqrt{7} + 5)(2\sqrt{7} - 5)$ $J = (2\sqrt{7})^2 - 5^2$ $J = 28 - 25$ <b><math>J = 3</math></b>
$C = (5 + 2\sqrt{7})^2$ $C = 5^2 + 2 \times 5 \times 2\sqrt{7} + (2\sqrt{7})^2$ $C = 25 + 20\sqrt{7} + 28$ <b><math>C = 53 + 20\sqrt{7}</math></b>	$G = (6\sqrt{2} - 5)^2$ $G = (6\sqrt{2})^2 - 2 \times 6\sqrt{2} \times 5 + 5^2$ $G = 72 - 60\sqrt{2} + 25$ <b><math>G = 97 - 60\sqrt{2}</math></b>	$K = (2 - 3\sqrt{3})(2 + 3\sqrt{3})$ $K = 2^2 - (3\sqrt{3})^2$ $K = 4 - 27$ <b><math>K = -23</math></b>
$D = (4 + 3\sqrt{3})^2$ $D = 4^2 + 2 \times 4 \times 3\sqrt{3} + (3\sqrt{3})^2$ $D = 16 + 24\sqrt{3} + 27$ <b><math>D = 43 + 24\sqrt{3}</math></b>	$H = (3\sqrt{6} - 4)^2$ $H = (3\sqrt{6})^2 - 2 \times 3\sqrt{6} \times 4 + 4^2$ $H = 54 - 24\sqrt{6} + 16$ <b><math>H = 70 - 24\sqrt{6}</math></b>	$L = (4\sqrt{10} - 3)(4\sqrt{10} + 3)$ $L = (4\sqrt{10})^2 - 3^2$ $L = 160 - 9$ <b><math>L = 151</math></b>



### Exercice 3 :

$A = \sqrt{36} + \sqrt{8} + \sqrt{50}$ $A = 6 + \sqrt{4 \times 2} + \sqrt{25 \times 2}$ $A = 6 + \sqrt{4} \times \sqrt{2} + \sqrt{25} \times \sqrt{2}$ $A = 6 + 2\sqrt{2} + 5\sqrt{2}$ <b><math>A = 6 + 7\sqrt{2}</math></b>	$E = (\sqrt{3} + \sqrt{2})^2$ $E = (\sqrt{3})^2 + 2 \times \sqrt{2} \times \sqrt{3} + (\sqrt{2})^2$ $E = 3 + 2\sqrt{6} + 2$ <b><math>E = 5 + 2\sqrt{6}</math></b>
$B = \sqrt{100} + \sqrt{18} - 2\sqrt{72}$ $B = 10 + \sqrt{9 \times 2} - 2 \times \sqrt{36 \times 2}$ $B = 10 + \sqrt{9} \times \sqrt{2} - 2 \times \sqrt{36} \times \sqrt{2}$ $B = 10 + 3 \times \sqrt{2} - 2 \times 6 \times \sqrt{2}$ $B = 10 + 3\sqrt{2} - 12\sqrt{2}$ <b><math>B = 10 - 9\sqrt{2}</math></b>	$F = (\sqrt{5} + \sqrt{7})^2$ $F = (\sqrt{5})^2 + 2 \times \sqrt{5} \times \sqrt{7} + (\sqrt{7})^2$ $F = 5 + 2\sqrt{35} + 7$ <b><math>F = 12 + 2\sqrt{35}</math></b>
$C = \sqrt{117} - 2\sqrt{208} + \sqrt{121}$ $C = \sqrt{9 \times 13} - 2 \times \sqrt{16 \times 13} + 11$ $C = \sqrt{9} \times \sqrt{13} - 2 \times \sqrt{16} \times \sqrt{13} + 11$ $C = 3\sqrt{13} - 2 \times 4 \times \sqrt{13} + 11$ $C = 3\sqrt{13} - 8\sqrt{13} + 11$ <b><math>C = -5\sqrt{13} + 11</math></b>	$G = (2\sqrt{3} + 3\sqrt{2})^2$ $G = (2\sqrt{3})^2 + 2 \times 2\sqrt{3} \times 3\sqrt{2} + (3\sqrt{2})^2$ $G = 12 + 12\sqrt{6} + 18$ <b><math>G = 30 + 12\sqrt{6}</math></b>
$D = \sqrt{44} - 2\sqrt{99} + 5\sqrt{81}$ $D = \sqrt{4 \times 11} - 2 \times \sqrt{9 \times 11} + 5 \times 9$ $D = \sqrt{4} \times \sqrt{11} - 2 \times \sqrt{9} \times \sqrt{11} + 45$ $D = 2 \times \sqrt{11} - 2 \times 3 \times \sqrt{11} + 45$ $D = 2\sqrt{11} - 6\sqrt{11} + 45$ <b><math>D = -4\sqrt{11} + 45</math></b>	$H = (3\sqrt{5} + 4\sqrt{7})^2$ $H = (3\sqrt{5})^2 + 2 \times 3\sqrt{5} \times 4\sqrt{7} + (4\sqrt{7})^2$ $H = 45 + 24\sqrt{35} + 112$ <b><math>H = 157 + 24\sqrt{35}</math></b>

$I = (\sqrt{2} - \sqrt{3})^2$ $I = (\sqrt{2})^2 - 2 \times \sqrt{2} \times \sqrt{3} + (\sqrt{3})^2$ $I = 2 - 2\sqrt{6} + 3$ $\boxed{E = 5 - 2\sqrt{6}}$	$M = (2\sqrt{3} + 3\sqrt{2})(2\sqrt{3} - 3\sqrt{2})$ $M = (2\sqrt{3})^2 - (3\sqrt{2})^2$ $M = 12 - 18$ $\boxed{M = -6}$
$J = (\sqrt{6} - \sqrt{11})^2$ $J = (\sqrt{6})^2 - 2 \times \sqrt{6} \times \sqrt{11} + (\sqrt{11})^2$ $J = 6 - 2\sqrt{66} + 11$ $\boxed{J = 17 - 2\sqrt{66}}$	$N = (2\sqrt{7} + 5\sqrt{3})(2\sqrt{7} - 5\sqrt{3})$ $N = (2\sqrt{7})^2 - (5\sqrt{3})^2$ $N = 28 - 75$ $\boxed{N = -47}$
$K = (2\sqrt{5} - 3\sqrt{7})^2$ $K = (2\sqrt{5})^2 - 2 \times 2\sqrt{5} \times 3\sqrt{7} + (3\sqrt{7})^2$ $K = 20 - 12\sqrt{35} + 63$ $\boxed{K = 83 - 12\sqrt{35}}$	$P = (4\sqrt{5} - 2\sqrt{2})(4\sqrt{5} + 2\sqrt{2})$ $P = (4\sqrt{5})^2 - (2\sqrt{2})^2$ $P = 80 - 8$ $\boxed{P = 72}$
$L = (5\sqrt{3} - 4\sqrt{2})^2$ $L = (5\sqrt{3})^2 - 2 \times 5\sqrt{3} \times 4\sqrt{2} + (4\sqrt{2})^2$ $L = 75 - 40\sqrt{6} + 32$ $\boxed{L = 107 - 40\sqrt{6}}$	$Q = (\sqrt{98} - \sqrt{97})(\sqrt{98} + \sqrt{97})$ $Q = (\sqrt{98})^2 - (\sqrt{97})^2$ $Q = 98 - 97$ $\boxed{Q = 1}$



**Exercice 4 :** On donne  $A = (2x + 7)^2 - (2x + 7)(3x - 1)$

1.  $x = \sqrt{2}$

$$A = (2\sqrt{2} + 7)^2 - (2\sqrt{2} + 7)(3\sqrt{2} - 1)$$

$$A = (2\sqrt{2})^2 + 2 \times 2\sqrt{2} \times 7 + 7^2 - (12 - 2\sqrt{2} + 21\sqrt{2} - 7)$$

$$(2\sqrt{2} \times 3\sqrt{2} = 12)$$

$$A = 8 + 28\sqrt{2} + 49 - 12 + 2\sqrt{2} - 21\sqrt{2} + 7$$

$$A = 8 + 49 - 12 + 7 + 28\sqrt{2} + 2\sqrt{2} - 21\sqrt{2}$$

$$\boxed{A = 52 + 9\sqrt{2}}$$

2.  $x = \sqrt{3}$

$$A = (2\sqrt{3} + 7)^2 - (2\sqrt{3} + 7)(3\sqrt{3} - 1)$$

$$A = (2\sqrt{3})^2 + 2 \times 2\sqrt{3} \times 7 + 7^2 - (18 - 2\sqrt{3} + 21\sqrt{3} - 7)$$

$$(2\sqrt{3} \times 3\sqrt{3} = 18)$$

$$A = 12 + 28\sqrt{3} + 49 - 18 + 2\sqrt{3} - 21\sqrt{3} + 7$$

$$A = 12 + 49 - 18 + 7 + 28\sqrt{3} + 2\sqrt{3} - 21\sqrt{3}$$

$$\boxed{A = 50 + 9\sqrt{3}}$$

3.  $x = 2\sqrt{5}$

$$A = (4\sqrt{5} + 7)^2 - (4\sqrt{5} + 7)(6\sqrt{5} - 1)$$

$$A = (4\sqrt{5})^2 + 2 \times 4\sqrt{5} \times 7 + 7^2 - (120 - 4\sqrt{5} + 42\sqrt{5} - 7)$$

$$(4\sqrt{5} \times 6\sqrt{5} = 120)$$

$$A = 80 + 56\sqrt{5} + 49 - 120 + 4\sqrt{5} - 42\sqrt{5} + 7$$

$$A = 80 + 49 - 120 + 7 + 56\sqrt{5} + 4\sqrt{5} - 42\sqrt{5}$$

$$\boxed{A = 16 + 18\sqrt{5}}$$

4.  $x = 3\sqrt{3}$

$$A = (6\sqrt{3} + 7)^2 - (6\sqrt{3} + 7)(9\sqrt{3} - 1)$$

$$A = (6\sqrt{3})^2 + 2 \times 6\sqrt{3} \times 7 + 7^2 - (162 - 6\sqrt{3} + 63\sqrt{3} - 7)$$

$$(6\sqrt{3} \times 9\sqrt{3} = 162)$$

$$A = 108 + 84\sqrt{3} + 49 - 162 + 6\sqrt{3} - 63\sqrt{3} + 7$$

$$A = 108 + 49 - 162 + 7 + 84\sqrt{3} + 6\sqrt{3} - 63\sqrt{3}$$

$$\boxed{A = 2 + 27\sqrt{3}}$$

