

EXERCICE 1: (.../6)

1) Calculer : $A = 15 - 15 \div 5 - 5,5 \times 2$; $B = 7 - 7 \times 2 - 2 \times (-4,5)$; $C = 5 \times 3 - 3 \times 3 - 3$

2) Calculer : $D = \frac{-1}{-2} - \frac{3}{2} + 2$; $E = \frac{16}{4} \times \frac{6}{4} - 1$; $F = \frac{9}{4} \div \frac{9}{20} + 1$

3) Calculer : $G = \frac{10}{3} - \frac{5}{3} \times \frac{4}{5} + 5$; $H = 1 \div \frac{1}{4} + 5 \times \left(1 - \frac{1}{5}\right)$

CORRECTION:

1) On a :

$$A = 15 - 15 \div 5 - 5,5 \times 2 = 15 - 3 - 11 = 1 \quad ; \quad B = 7 - 7 \times 2 - 2 \times (-4,5) = 7 - 14 + 9 = 2$$

$$C = 5 \times 3 - 3 \times 3 - 3 = 15 - 9 - 3 = 15 - 12 = 3$$

2) On a : $D = \frac{-1}{-2} + \frac{3}{2} + 2 = \frac{1}{2} + \frac{3}{2} + 2 = \frac{1+3}{2} + 2 = \frac{4}{2} + 2 = 2 + 2 = 4$

$$E = \frac{16}{4} \times \frac{6}{4} - 1 = 4 \times \frac{6}{4} - 1 = 6 - 1 = 5 \quad ; \quad F = \frac{9}{4} \div \frac{9}{20} + 1 = \frac{9}{4} \times \frac{20}{9} + 1 = 5 + 1 = 6$$

3) On a :

$$G = \frac{10}{3} - \frac{5}{3} \times \frac{4}{5} + 5 = \frac{10}{3} - \frac{4}{3} + 5 = \frac{6}{3} + 5 = 2 + 5 = 7 \quad ; \quad H = 1 \div \frac{1}{4} + 5 \times \left(1 - \frac{1}{5}\right) = 4 + 5 - 1 = 8$$

EXERCICE 2: (.../4)

1) Calculer : $I = \frac{-20}{-2} - 2^3 + 2$

2) Ecrire sous forme d'une puissance :

$$J = 3^6 \times 3^3 \quad ; \quad K = (2^5)^{-2} \quad ; \quad L = 16^2 \div (8-4)^2 \quad ; \quad M = (-7)^2 - \left(\frac{1}{50}\right)^{-1}$$

3) Donner l'écriture scientifique de chaque nombre :

$$N = 50000 \quad ; \quad P = 0,0003$$

4) Ecrire sous forme de la puissance de 10 : $Q = 0,007 \times 10^5 + 3 \times 10^2$

CORRECTION:

1) On a : $I = \frac{-20}{-2} - 2^3 + 2 = 10 - 8 + 2 = 4$

2) On a : $J = 3^6 \times 3^3 = 3^{6+3} = 3^9$; $K = (2^5)^{-2} = 2^{5 \times (-2)} = 2^{-10}$

$$L = 16^2 \div (8-4)^2 = 16^2 \div 4^2 = (16 \div 4)^2 = 4^2 = 2^4$$

$$M = \left[(-7)^2 - \left(\frac{1}{50}\right)^{-1} \right] (-2)^3 = (49 - 50)(-2)^3 = 2^3$$

3) On a : $N = 50000 = 5 \times 10^4$; $P = 0,0003 = 3 \times 10^{-4}$

4) On a :

$$Q = 0,007 \times 10^5 + 3 \times 10^2 = 7 \times 10^{-3} \times 10^5 + 3 \times 10^2 = 7 \times 10^2 + 3 \times 10^2 \\ = (7+3) \times 10^2 = 10 \times 10^2 = 10^3$$

EXERCICE 3 : (.../3)

1) Développer et simplifier les expressions suivantes :

$$R = (x + 2)^2 - 2x(0,5x + 2) \quad ; \quad S = (x - 2)^2 - x(x - 4)$$

2) Factoriser les expressions suivantes :

$$T = 4x + 6 \quad ; \quad V = 9x^2 - 4 \quad ; \quad W = (x + 1)^2 - (x + 1)(2x + 1)$$

1,5

CORRECTION :

1) On a :

$$R = (x + 2)^2 - 2x(0,5x + 2) = x^2 + 4x + 4 - x^2 - 4x = 4$$

1,5

$$S = (x - 2)^2 - x(x - 4) = x^2 - 4x + 4 - x^2 + 4x = 4$$

2) On a :

$$T = 4x + 6 = 2(x + 3) \quad ; \quad V = 9x^2 - 4 = (3x)^2 - 2^2 = (3x - 2)(3x + 2)$$

3) On a :

$$W = (x + 1)^2 - (x + 1)(2x + 1) = (x + 1)[(x + 1) - (2x + 1)] = (x + 1)(x + 1 - 2x - 1) = -x(x + 1)$$

EXERCICE 4 : (.../6)

1) Calculer :

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$$A = \sqrt{23^2 - 4^2} \quad ; \quad B = \sqrt{25} + 0,5 \times \sqrt{36} \quad ; \quad C = \sqrt{49} + (-1)^2 \times 2 \quad ;$$

$$D = 3 + (\sqrt{7} + 3)(\sqrt{7} - 3)$$

1,5

$$2) \text{ Simplifier : } E = 9\sqrt{3} - 5\sqrt{3} - \sqrt{3} - 2\sqrt{3} \quad ; \quad F = \sqrt{36} - \sqrt{49} \quad ; \quad G = \sqrt{2} \times \sqrt{4,5} - 4$$

3) Ecrire sous la forme $a\sqrt{b}$ tel que b soit le plus petit possible :

1

$$H = \sqrt{27} \quad ; \quad I = \sqrt{8} + \sqrt{2}$$

0,5

4) Enlever les crochets et les parenthèses puis calculer ce qui suit :

$$J = \sqrt{3} \times \sqrt{2} - \left[(2\sqrt{6} - 8) - \sqrt{6} \right]$$

1

5) Rendre rationnel le dénominateur : $K = \frac{\sqrt{2,5}}{\sqrt{2}} \quad ; \quad L = \frac{5}{\sqrt{6}-1}$ **CORRECTION :**

$$1) \text{ On a : } A = \sqrt{23^2 - 4^2} = 23 - 16 = 7 \quad ; \quad B = \sqrt{25} + 0,5 \times \sqrt{36} = 5 + 0,5 \times 6 = 5 + 3 = 8$$

$$C = \sqrt{49} + (-1)^2 \times 2 = 7 + 1 \times 2 = 7 + 2 = 9 \quad ; \quad D = 3 + (\sqrt{7} + 3)(\sqrt{7} - 3) = 3 + 7 - 9 = 1$$

$$2) \text{ On a : } E = 9\sqrt{3} - 5\sqrt{3} - \sqrt{3} - 2\sqrt{3} = (9 - 5 - 1 - 2)\sqrt{3} = \sqrt{3} \quad ; \quad F = \sqrt{36} - \sqrt{49} = 6 - 7 = -1$$

$$G = \sqrt{2} \times \sqrt{4,5} - 4 = \sqrt{2 \times 4,5} - 4 = \sqrt{9} - 4 = 3 - 4 = -1$$

3) On a :

$$H = \sqrt{27} = \sqrt{9 \times 3} = \sqrt{9} \times \sqrt{3} = 3\sqrt{3} \quad ; \quad I = \sqrt{8} + \sqrt{2} = \sqrt{4 \times 2} + \sqrt{2} = \sqrt{4} \times \sqrt{2} + \sqrt{2} = 2\sqrt{2} + \sqrt{2} = 3\sqrt{2}$$

$$4) \text{ On a : } J = \sqrt{3} \times \sqrt{2} - \left[(2\sqrt{6} - 8) - \sqrt{6} \right] = \sqrt{6} - (2\sqrt{6} - 8) + \sqrt{6} = 2\sqrt{6} - 2\sqrt{6} + 8 = 8$$

$$5) \text{ On a : } K = \frac{\sqrt{2,5}}{\sqrt{2}} = \frac{\sqrt{2,5 \times 2}}{\sqrt{2} \times \sqrt{2}} = \frac{\sqrt{5}}{2} \quad ; \quad L = \frac{5}{\sqrt{6}-1} = \frac{5(\sqrt{6}+1)}{(\sqrt{6}-1)(\sqrt{6}+1)} = \frac{5(\sqrt{6}+1)}{6-1} = \sqrt{6}+1$$

EXERCICE 5: (.../1)

1

On pose: $X = \sqrt{2+\sqrt{3}} \times \sqrt{\sqrt{3}+\sqrt{\sqrt{3}+1}} \times \sqrt{\sqrt{3}-\sqrt{\sqrt{3}+1}}$.

Démontrer que X est un entier naturel.

CORRECTION:

On a :

$$\begin{aligned} X &= \sqrt{2+\sqrt{3}} \times \sqrt{\sqrt{3}+\sqrt{\sqrt{3}+1}} \times \sqrt{\sqrt{3}-\sqrt{\sqrt{3}+1}} = \sqrt{2+\sqrt{3}} \times \sqrt{(\sqrt{3}+\sqrt{\sqrt{3}+1})(\sqrt{3}-\sqrt{\sqrt{3}+1})} \\ &= \sqrt{2+\sqrt{3}} \times \sqrt{3-\sqrt{3}-1} = \sqrt{2+\sqrt{3}} \times \sqrt{2-\sqrt{3}} = \sqrt{2^2 - (\sqrt{3})^2} = \sqrt{4-3} = \sqrt{1} = 1 \end{aligned}$$