2^{nde} 4 – Corrigé de l'interrogation de mathématiques n°1

Exercice 1 :

$$A = \frac{5 + \frac{3}{4} - \frac{1}{3}}{5 - \frac{3}{4} + \frac{1}{3}}$$

$$A = \frac{\frac{5\times 12}{1\times 12} + \frac{3\times 3}{4\times 3} - \frac{1\times 4}{3\times 4}}{\frac{5\times 12}{1\times 12} - \frac{3\times 3}{4\times 3} + \frac{1\times 4}{4\times 4}}$$

$$A = \frac{\frac{60}{12} + \frac{9}{12} - \frac{4}{12}}{\frac{60}{12} - \frac{9}{12} + \frac{4}{12}}$$

$$A = \frac{\frac{65}{12}}{\frac{55}{12}} = \frac{65}{55} = \boxed{\frac{13}{11}}$$

$$B = \frac{4}{5} - \frac{12}{25} \times \frac{30}{2} \times \frac{-14}{9}$$

$$B = \frac{4}{5} + \frac{3\times 4\times 2\times 5\times 3\times 2\times 7}{5\times 5\times 2\times 3\times 3}$$

$$B = \frac{4}{5} + \frac{56}{5}$$

$$B = \frac{60}{5} = \boxed{12}$$

Exercice 2 :

$$C = \frac{18\times 10^{7}\times 25\times (10^{-3})^{5}}{15\times 10^{14}}$$

$$C = \frac{18\times 25}{15} \times \frac{10^{7}\times 10^{-15}}{10^{14}}$$

$$C = \frac{3\times 6\times 5\times 5}{3\times 5} \times \frac{10^{-8}}{10^{14}}$$

$$C = 30\times 10^{-22}$$

$$C = \boxed{3\times 10^{-21}}$$

Exercice 3 :

$$D = 3\sqrt{54} + 2\sqrt{24} - 5\sqrt{96}$$

$$D = 3\sqrt{9\times 6} + 2\sqrt{4\times 6} - 5\sqrt{16\times 6}$$

$$D = 3\sqrt{9}\sqrt{6} + 2\sqrt{4}\sqrt{6} - 5\sqrt{16}\sqrt{6}$$

$$D = 9\sqrt{6} + 4\sqrt{6} - 20\sqrt{6}$$

$$D = \boxed{-7\sqrt{6}}$$

Exercice 4 :

1) $G(x) = 16x^2 - (3 - 2x)^2$

$G(x) = 16x^2 - (9 - 12x + 4x^2)$

$G(x) = 16x^2 - 9 + 12x - 4x^2$

$\boxed{G(x) = 12x^2 + 12x - 9}$

2) $G(x) = 16x^2 - (3 - 2x)^2$

$G(x) = (4x)^2 - (3 - 2x)^2$

$G(x) = [4x - (3 - 2x)]\,[\,4x + 3 - 2x]$

$G(x) = [4x - 3 + 2x]\,[\,4x + 3 - 2x\,]$

$\boxed{G(x) = (6x-3)\,(2x+3)}$

$\boxed{G(x) = 3(2x - 1)(2x+3)}$

3) $G(x) = 0 \Leftrightarrow (6x - 3)(2x + 3) = 0 \Leftrightarrow 6x - 3 = 0$ ou $2x + 3 = 0$

$G(x) = 0 \Leftrightarrow 6x = 3$ ou $2x = -3 \Leftrightarrow x = \frac{3}{6} = \frac{1}{2}$ ou $x = -\frac{3}{2}$ $\quad \boxed{S = \{-\frac{3}{2}\,;\,\frac{1}{2}\}}$

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Exercice 1 :

$$A = \frac{5 - \frac{3}{4} + \frac{1}{3}}{5 + \frac{3}{4} - \frac{1}{3}}$$

$$A = \frac{\frac{5 \times 12}{1 \times 12} - \frac{3 \times 3}{4 \times 3} + \frac{1 \times 4}{3 \times 4}}{\frac{5 \times 12}{1 \times 12} + \frac{3 \times 3}{4 \times 3} - \frac{1 \times 4}{3 \times 4}}$$

$$A = \frac{\frac{60}{12} - \frac{9}{12} + \frac{4}{12}}{\frac{60}{12} + \frac{9}{12} - \frac{4}{12}}$$

$$A = \frac{\frac{55}{12}}{\frac{65}{12}} = \frac{55}{65} = \boxed{\frac{11}{13}}$$

$$B = \frac{3}{5} - \frac{12}{15} \times \frac{30}{2} \times \frac{-7}{15}$$

$$B = \frac{3}{5} + \frac{3 \times 4 \times 15 \times 2 \times 7}{15 \times 2 \times 3 \times 5}$$

$$B = \frac{3}{5} + \frac{4 \times 7}{15}$$

$$B = \frac{3}{5} + \frac{28}{5} = \boxed{\frac{31}{5}}$$

Exercice 2 :

$$C = \frac{12 \times 10^8 \times 25 \times (10^{-4})^4}{15 \times 10^{12}}$$

$$C = \frac{12 \times 25}{15} \times \frac{10^8 \times 10^{-16}}{10^{12}}$$

$$C = \frac{3 \times 4 \times 5 \times 5}{3 \times 5} \times \frac{10^{-8}}{10^{12}}$$

$$C = 20 \times 10^{-20}$$

$$C = \boxed{2 \times 10^{-19}}$$

Exercice 3 :

$$D = 3\sqrt{45} + 4\sqrt{20} - 5\sqrt{80}$$

$$D = 3\sqrt{9 \times 5} + 4\sqrt{4 \times 5} - 5\sqrt{16 \times 5}$$

$$D = 3\sqrt{9}\sqrt{5} + 4\sqrt{4}\sqrt{5} - 5\sqrt{16}\sqrt{5}$$

$$D = 9\sqrt{5} + 8\sqrt{5} - 20\sqrt{5}$$

$$\boxed{D = -3\sqrt{5}}$$

Exercice 4 :

1) $G(x) = 9x^2 - (5 - 2x)^2$

$G(x) = 9x^2 - (25 - 20x + 4x^2)$

$G(x) = 9x^2 - 25 + 20x - 4x^2$

$\boxed{G(x) = 5x^2 + 20x - 25}$

2) $G(x) = 9x^2 - (5 - 2x)^2$

$G(x) = (3x)^2 - (5 - 2x)^2$

$G(x) = [3x - (5 - 2x)][3x + 5 - 2x]$

$G(x) = (3x - 5 + 2x)(x + 5)$

$\boxed{G(x) = (5x - 5)(x + 5)}$

$\boxed{G(x) = 5 (x - 1) (x + 5)}$

3) $G(x) = 0 \Leftrightarrow (5x - 5)(x + 5) = 0 \Leftrightarrow 5x - 5 = 0$ ou $x + 5 = 0$

$\Leftrightarrow 5x = 5$ ou $x = -5 \Leftrightarrow x = 1$ ou $x = -5$ $\quad S = \{-5 ; 1\}$