

Correction Interro 1

Exercice 1

$$-6 \in \mathbb{Q} \quad \{2 \times 10^{-2}; 5; -\frac{3}{5}\} \subset \mathbb{D} \quad \frac{\frac{5}{3}}{3} \notin \mathbb{Z} \quad \{10^\circ; \frac{8}{2}; 5\} \subset \mathbb{N}$$

Exercice 2

$$A = \frac{1}{3} - \frac{2}{3} \times \frac{9}{5}$$

$$A = \frac{1}{3} - \frac{2 \times 3 \times 3}{3 \times 5}$$

$$A = \frac{1}{3} - \frac{6}{5}$$

$$A = \frac{5}{15} - \frac{18}{15}$$

$$\underline{\underline{A = -\frac{13}{15}}}$$

$$B = \frac{\frac{3}{7} - \frac{2}{5}}{1 - \frac{2}{5}}$$

$$B = \frac{\frac{15}{35} - \frac{14}{35}}{\frac{5}{5} - \frac{2}{5}}$$

$$B = \frac{\frac{1}{35}}{\frac{3}{5}}$$

$$B = \frac{1}{7 \times 5} \times \frac{5}{3}$$

$$\underline{\underline{B = \frac{1}{21}}}$$

$$C = \left(\frac{7}{5} - \frac{3}{2}\right) - \left(\frac{7}{8} - \left(\frac{3}{4} - 1\right)\right)$$

$$C = \frac{14}{10} - \frac{15}{10} - \left(\frac{7}{8} - \left(-\frac{1}{4}\right)\right)$$

$$C = -\frac{1}{10} - \left(\frac{7}{8} + \frac{2}{8}\right)$$

$$C = -\frac{1}{10} - \frac{9}{8}$$

$$C = -\frac{4}{40} - \frac{45}{40}$$

$$\underline{\underline{C = -\frac{49}{40}}}$$

$$D = 2 - 5\left(\frac{7}{5} - 1\right)^2$$

$$D = 2 - 5\left(\frac{7}{5} - \frac{5}{5}\right)^2$$

$$D = 2 - 5 \times \left(\frac{2}{5}\right)^2$$

$$D = 2 - 5 \times \frac{4}{25}$$

$$D = \frac{10}{5} - \frac{4}{5}$$

$$\underline{\underline{D = \frac{6}{5}}}$$

Exercise 3

$$1) A = a^3 \times \frac{b}{b^3 a} \times \frac{1}{a^4}$$

$$A = a^{3-1-4} \times b^{1-3}$$

$$\underline{\underline{A = a^{-2} \times b^{-4}}}$$

$$B = (a^2 b^3)^{-2} \times \frac{ab^2}{a^8}$$

$$B = a^{-4} b^{-6} \times \frac{ab^2}{a^8}$$

$$B = a^{-4+1-8} \times b^{-6+2}$$

$$\underline{\underline{B = a^{-11} \times b^{-4}}}$$

$$2) C = \frac{2^8 \times 13^5}{13^{11} \times 2}$$

$$C = 2^{8-1} \times 13^{5-11}$$

$$\underline{\underline{C = 2^7 \times 13^{-6}}}$$

$$D = \frac{11^8 \times 11^7 \times 9}{(3 \times 11^2)^6}$$

$$D = \frac{11^{15} \times 3^2}{3^6 \times 11^{12}}$$

$$D = 11^{15-12} \times 3^{2-6}$$

$$\underline{\underline{D = 11^3 \times 3^{-4}}}$$

$$E = (3^4)^{-2} \times \frac{3^{12} \times 4^7 \times 9^3 \times 7^3}{16^2 \times 3^8 \times 7} \times (2 \times 7)^{-2}$$

$$E = 3^{-8} \times \frac{3^{12} \times (2^2)^7 \times (3^2)^3 \times 7^3}{(2^4)^2 \times 3^8 \times 7} \times 2^{-2} \times 7^{-2}$$

$$E = 3^{-8} \times \frac{3^{12} \times 2^{14} \times 3^6 \times 7^3}{2^8 \times 3^8 \times 7} \times 2^{-2} \times 7^{-2}$$

$$E = 3^{-8+12+6-8} \times 2^{14-8-2} \times 7^{3-1-2}$$

$$\underline{\underline{E = 3^2 \times 2^4}}$$

Exercise 4:

$$A = (x-1)^2$$

$$\underline{\underline{A = x^2 - 2x + 1}}$$

$$B = (3x+4)^2$$

$$\underline{\underline{B = 9x^2 + 24x + 16}}$$

$$C = 2(x+3)(x-2)$$

$$C = (2x+6)(x-2)$$

$$C = 2x^2 - 4x + 6x - 12$$

$$\underline{\underline{C = 2x^2 + 2x - 12}}$$

$$D = -2(1-3x) + (2x+3)^2$$

$$D = -2 + 6x + 4x^2 + 12x + 9$$

$$\underline{\underline{D = 4x^2 + 18x + 7}}$$

$$E = +3(-2+x) - (x-1)(x+3)$$

$$= -6 + 3x - (x^2 + 3x - x - 3)$$

$$= -6 + 3x - x^2 - 3x + x + 3$$

$$\underline{\underline{E = -x^2 + x - 3}}$$

$$F = (2x-1)^3$$

$$F = (2x-1)^2 \times (2x-1)$$

$$F = (4x^2 - 4x + 1)(2x-1)$$

$$F = 8x^3 - 8x^2 + 2x - 4x^2 + 4x - 1$$

$$\underline{\underline{F = 8x^3 - 12x^2 + 6x - 1}}$$

Exercise 5:

1) $x \in \mathbb{R} \setminus \{-1; 2\}$

$$A = \frac{3}{x-1} + \frac{2}{x-2}$$

$$A = \frac{3(x-2) + 2(x-1)}{(x-1)(x-2)}$$

$$A = \frac{3x-6+2x-2}{(x-1)(x-2)}$$

$$A = \frac{5x-8}{(x-1)(x-2)}$$

2) $a \in \mathbb{R}^* \setminus \{-1\}$

$$B = \frac{1}{a+1} - \frac{1 - \frac{1}{a}}{1 + \frac{1}{a}}$$

$$B = \frac{1}{a+1} - \frac{\frac{a-1}{a}}{\frac{a+1}{a}}$$

$$B = \frac{1}{a+1} - \frac{a-1}{a} \times \frac{a}{a+1}$$

$$B = \frac{1-a+1}{a+1}$$

$$B = \frac{2-a}{a+1}$$

Exercise 6:

Pour $n \in \mathbb{N}^*$, $\frac{1}{n} - \frac{1}{n+1} = \frac{1(n+1) - 1 \times n}{n(n+1)}$

$$\frac{1}{n} - \frac{1}{n+1} = \frac{n+1-n}{n+1}$$

$$\frac{1}{n} - \frac{1}{n+1} = \frac{1}{n+1}$$

Bonus! $C = \frac{1}{1 \times 2} + \frac{1}{2 \times 3} + \frac{1}{3 \times 4} + \dots + \frac{1}{998 \times 999} + \frac{1}{999 \times 1000}$

$$C = \frac{1}{1} - \frac{1}{2} + \frac{1}{2} - \frac{1}{3} + \frac{1}{3} - \frac{1}{4} + \dots + \frac{1}{998} - \frac{1}{999} + \frac{1}{999} - \frac{1}{1000}$$

$$C = 1 - 0,001$$

$$C = 0,999$$