

I) Fractions : (même dénominateur + simplifier)

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

$$B = \frac{1}{2x} + \frac{3}{x}$$

$$C = \frac{x}{5} + \frac{5}{x}$$

$$D = \frac{a}{a-1} - \frac{2}{2a-2}$$

$$E = \frac{\frac{3}{2} - 1}{1,5 + 1} \times \frac{5^3}{18}$$

$$F = \frac{2}{5-x} - \frac{1}{x}$$

$$G = \frac{1}{2} \times \frac{2}{3} \times \frac{3}{4} \times \frac{4}{5} \times \frac{5}{6} \times \frac{6}{7} \times \frac{7}{8} \times \frac{8}{9} \times \frac{9}{10}$$

$$H = \frac{1}{x-1} + \frac{1}{x+1}$$

$$I = a^{-2} + \frac{\left(\frac{1}{2a} + \frac{1}{a} \right)^2}{\frac{5}{4}}$$

$$J = \frac{2 + \frac{1}{3} - \frac{1}{2}}{2 + \frac{3}{4} + \frac{1}{3}}$$

$$K = \frac{2+3}{2+7} \div \left(\frac{5}{3} \right)^2$$

$$L = \frac{2}{a} - \frac{7}{5} \times \frac{1}{\frac{a}{4} - \frac{a}{2}}$$

$$M = \frac{7}{18} \times \frac{2}{7} - \left(\frac{5}{3} - 1 \right)^2 + 1$$

$$N = \frac{\frac{7}{6} - \frac{a}{3}}{1 - \frac{4a}{14}} \times \frac{a^2}{7}$$

$$O = \left(\frac{2}{5} - \frac{3}{4} \right)^2 \div \frac{5}{8} - \frac{8}{3}$$

$$P = \frac{a}{3} - \frac{a}{3} \times \frac{7}{21} - \frac{7}{21}$$

$$Q = \frac{\frac{3}{4} - \frac{2}{3}}{\frac{3}{4} + \frac{2}{3}} \div \frac{\frac{4}{5} - \frac{3}{4}}{\frac{4}{5} + \frac{3}{4}}$$

$$R = \frac{a + \frac{a}{3} - \frac{a}{2}}{2a + \frac{3a}{4} + \frac{a}{3}}$$

$$S = \frac{2 + \frac{1}{2}}{2 - \frac{1}{2}} \times \frac{5 + \frac{1}{3}}{5 - \frac{1}{3}} \times \frac{7 - \frac{5}{2}}{1 - \frac{1}{7}}$$

$$T = \frac{-5 + 3^2 \times 2 + 4}{12 \times 2 + 10}$$

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

II) Puissances : (simplifier)

$$A = \frac{49 \times (-2)^5 \times (-3)^{-2}}{-7^3 \times 16 \times 3^{-3}}$$

$$B = \frac{(-5)^4 \times 7^2 \times (-2)^{-3}}{(-4)^4 \times (-1)^5 \times 25}$$

$$C = \left(\frac{(a^2 b^4)^2}{a^3} \right)^{-3}$$

$$D = 0,0000000005 \times 1004000000$$

$$E = \frac{2^3 \div 2^2}{3^4 \div 3^5}$$

$$F = \frac{(a^2 b)^3}{(-a)(-b)^2}$$

$$G = \left(\frac{4^{-2} \times 8^4}{90^7 \times 30^{-2}} \right)^3$$

$$H = \left(\frac{5^5 \times 24^{-3}}{(100^{-7} \times 15^6)^4} \right)^2$$

$$I = \frac{2^2 \times 10^{-10} \times 2^7 \times 10^{-6}}{32 \times 10^{-15}}$$

$$J = \frac{72 \times 10^{-3} \times 2 \times 10^5}{12 \times 10^2 \times 4 \times 10^{-1}}$$

$$K = \left(\frac{a^3 b^{-2}}{a^4 b^{-3}} \right)^{-2} \times \frac{(3a^2 b^3)^3}{(2^{-1} ab)^2}$$

$$L = \frac{5^3 \times 3^8 \times 5^2}{125 \times 5^2 \times 81 \times 7^0}$$

$$M = \frac{0,9 \times 7 \times 10^{-1} \times 250}{14 \times 10^3 \times 0,5 \times 10^{-2}}$$

$$N = \frac{0,04 \times 2^{-2} \times (10^{-2})^3 \times 10^2}{3 \times 10^{-8} \times 10^{-2}}$$

$$O = \frac{(56^8 \times 81^{-2} \times 25^7)^3}{(50^5 \times 700^3)^4}$$

$$P = \frac{0,09 \times 7 \times 10^{-1} \times \sqrt{25}}{14 \times 10^3 \times 0,5 \times 10^{-2}}$$

$$Q = \frac{25 \times (10^2)^{-5} \times 121}{11 \times 75 \times 10^{-9}}$$

$$R = \frac{(56 \times 27^{-1} \times 25^2)^{-1} (\sqrt{7})^4}{100 \times 0,000001}$$

$$S = \frac{(0,3 \times 10^2)^2 \times 5 \times 10^{-3}}{4 \times 10^{-4} + 0,0002}$$

$$T = \frac{9 \times (10^2)^3 \times 2^2 \times 10^5 \times 10^{-6}}{(10^2)^2}$$

$$U = \frac{4,5 \times 10^{-4} \times 8 \times 10^6}{3^2 \times 10^2} \times \left(\frac{(-3)^5 \times 5^4}{15^2 \times 3^4} \right)$$

$$V = \frac{(-5)^3 \times 7^2 \times (-\sqrt{2})^{-3}}{(-4)^2 \times 35 \times (-1)^5 \times 25}$$

$$W = \frac{0,024 \times (-10)^7 \times \sqrt{121} \times 0,001}{12 \times 16 \times 12}$$

$$X = \frac{9^{n+1} + 9^n}{3^{2n+1} - 3^{2n}} \quad (n \in \mathbb{N})$$

$$Y = \frac{(ab^2)^2 (ab^{-1})^3 (a^2 b)^{-2}}{a^2 c^{-5} (a^{-1} bc^2)^3}$$

$$Z = \frac{(ab^{-2} c^3)^4 (a^4 b^5 c^{-6})^{-2}}{(a^{-7} b^8 c^7)^3 (a^6 b^5 c^4)^2}$$

III) Factorisations :

$$A = x^2 - 9 - (2x - 6)x + (x - 3)^2$$

$$B = (x - 11)^2 + (33 - 3x)(x + 2)$$

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

$$D = -0,3(2x - 3)^2 + 0,7x(1,5 - x)$$

$$E = (x + 1)(x + 4) - \left(\frac{x}{2} + 2 \right)$$

$$F = (2x - 3)(5 + x) - (3 - 2x)(2x + 1)$$

$$G = 0,25x^2 - x + 1$$

$$H = -9x^2 - 6x - 1$$

$$I = x^2 - (x + 1)^2$$

$$J = x^2 + x + \frac{1}{4}$$

$$K = -10 + (x + 5)^2 - 2x$$

$$L = 4x^2 - 16x + 16$$

$$M = 2x - 1 + (1 - 2x)^2 + 8x^2 \left(x - \frac{1}{2} \right)$$

$$N = x^2 \left(1 + \frac{1}{x} \right) + 2(x + 1)^2$$

$$O = 5(1 - x)^2 - 45x^2$$

$$P = (x + 1)^2 - 2(x + 1) + 1$$

$$Q = 4x^2 + x + \frac{1}{16}$$

$$R = x^5 + 4x^4 + 4x^3$$

$$S = (5x - 1)(x + 3) + 3(25x^2 - 1)$$

$$T = 49 - 28x + 4x^2 + (7 - 2x)(5 - 3x)$$

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

$$V = 4x^2 + 20x + 25$$

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

$$X = 12x^2 + 3(-4x + 1)$$

$$Y = x^2 - 2$$

$$Z = x^2 + 2\sqrt{2}x + 2$$