Correction Calculs du 13/07 au 19/07

Exercice 8 (Comparaison de fractions)
Comparer les fractions suivantes avec le signe $>$, $<$ ou $=$.

1. $\frac{3}{5} = \frac{27}{45} > \frac{5}{9} = \frac{25}{45}$
2. $\frac{12}{11} > \frac{10}{12}$
3. $\frac{125}{25} = 5 = \frac{105}{21}$

Exercice 9 (Simplification de fractions)
Simplifier chacune des fractions suivantes.

$$\begin{aligned} A &= \frac{234}{288} \\ &= \frac{2 \times 117}{2 \times 144} \\ &= \boxed{\frac{117}{144}} \end{aligned}$$

$$\begin{aligned} B &= \frac{(x^2 - x)(4 - 2x)}{x(2 - x)} \\ &= \frac{x(x-1) \times 2(2-x)}{x(2-x)} \\ &= \boxed{2(x-1)} \end{aligned}$$

$$\begin{aligned} C &= \frac{x^6(1 + x^3)}{x^3 + x^6} \\ &= \frac{x^3 \times x^3(1 + x^3)}{x^3(1 + x^3)} \\ &= \boxed{x^3} \end{aligned}$$

Exercice 10 (Produit de fraction)
Écrire sous la forme la plus simple possible.

$$\begin{aligned} A &= \frac{12}{42} \times \frac{7}{33} \times \frac{15}{21} \\ &= \frac{3 \times 2 \times 2}{2 \times 7 \times 3} \times \frac{7}{3 \times 11} \times \frac{5 \times 3}{3 \times 7} \\ &= \frac{2 \times 5}{11 \times 3 \times 7} \\ &= \boxed{\frac{10}{231}} \end{aligned}$$

$$\begin{aligned} B &= (x^2 - 2x)\frac{(x+3)}{2-x} \times \frac{x}{x^3 + 3x^2} \\ &= \frac{x(x-2)(x+3)}{2-x} \times \frac{x}{x^2(x+3)} \\ &= \boxed{-1} \end{aligned}$$

$$\begin{aligned} C &= -\frac{2x+4}{x} \times \frac{x}{-2x+4} \times \frac{2-x}{2+x} \\ &= -\frac{2(x+2)}{2(-x+2)} \times \frac{2-x}{2+x} \\ &= \boxed{-1} \end{aligned}$$

$$\begin{aligned} D &= \frac{18}{17} \times \frac{17}{16} \times \frac{16}{15} \times \frac{15}{14} \times \frac{14}{13} \times \frac{13}{12} \\ &= \frac{18}{12} \\ &= \boxed{\frac{3}{2}} \end{aligned}$$

Exercice 11 (Quotient de fractions)
Écrire sous forme de fractions irréductibles.

1. $A = \frac{\frac{2}{5}}{2} = \boxed{\frac{1}{5}}$.
2. $B = \frac{\frac{2}{5}}{5} = \boxed{\frac{2}{25}}$.
3. $C = \frac{-1}{\frac{-1}{-2}} = \boxed{-2}$.
4. $D = \frac{\frac{x}{5}}{\frac{x}{2}} = \boxed{\frac{2}{5}}$.

Exercice 12 (Développement)
Développer et réduire les expressions suivantes.

$$\begin{aligned} A &= \frac{4}{5}\left(\frac{x}{2} - \frac{5}{4}\right) \\ &= \boxed{\frac{2x}{5} - 1} \end{aligned}$$

$$\begin{aligned} B &= \left(\frac{x}{5} + \frac{4}{3}\right)\left(\frac{x}{5} - \frac{2}{3}\right) \\ &= \boxed{\frac{x^2}{25} + \frac{2x}{15} - \frac{8}{9}} \end{aligned}$$

$$\begin{aligned} C &= \left(\frac{x^2}{2} + \frac{x}{5}\right)^2 \\ &= \boxed{\frac{x^4}{4} + \frac{x^3}{5} + \frac{x^2}{25}} \end{aligned}$$

Exercice 13 (Factorisation)
Factoriser les expressions suivantes.

$$A = \frac{2x}{5} - \frac{6}{25} = \boxed{\frac{2}{5}\left(x - \frac{3}{5}\right)}$$

$$B = \frac{x^2}{25} - \frac{8x}{15} + \frac{16}{9} = \boxed{\left(\frac{x}{5} - \frac{4}{3}\right)^2}$$

$$C = \frac{x^2}{36} - \frac{25}{49} = \boxed{\left(\frac{x}{6} + \frac{5}{7}\right)\left(\frac{x}{6} - \frac{5}{7}\right)}$$

Exercice 14 (Plus difficile)
Écrire sous forme d'une fraction irréductible.

$$A = \frac{n-1}{n} \times \frac{n-2}{n-1} \times \frac{n-3}{n-2} \times \ldots \times \frac{2}{3} \times \frac{1}{2} = \boxed{\frac{1}{n}}$$

$$B = \frac{n-2}{n} \times \frac{n-3}{n-1} \times \frac{n-4}{n-2} \times \ldots \times \frac{2}{4} \times \frac{1}{3} = \frac{1}{n} \times \frac{1}{n-1} \times 2 \times 1 = \boxed{\frac{2}{n(n-1)}}$$

$$C = \frac{\dfrac{6(n+1)}{n(n-1)(2n-2)}}{\dfrac{2n+2}{n^2(n-1)^2}} = \frac{6(n+1)}{n(n-1)(2n-2)} \times \frac{n^2(n-1)^2}{2n+2} = \frac{6(n+1)}{2(n-1)} \times \frac{n(n-1)}{2(n+1)} = \boxed{\frac{3}{2}n}$$