TOMC **Devoir du 14/12/2022**

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Exercice 1

- $a(x) = 5 - 7x + x^4$

2 $A(x) = 5x - 7 \times \frac{1}{2}x^2 + \frac{1}{5}x^5$

i.e. $A(x) = 5x - \frac{7}{2}x^2 + \frac{1}{5}x^5$.

- $b(x) = x - \frac{5}{x^2} = x + 5 \times \frac{-1}{x^2}$

2 $B(x) = \frac{1}{2}x^2 + 5 \times \frac{1}{x}$ i.e. $B(x) = \frac{1}{2}x^2 + \frac{5}{x}$.

- $c(x) = (-3x+1)(x-4) = -3x^2 + 12x + x - 4 = -3x^2 + 13x - 4$

$C(x) = -3 \times \frac{1}{3}x^3 + 13 \times \frac{1}{2}x^2 - 4x$

2 i.e. $C(x) = -x^3 + \frac{13}{2}x^2 - 4x$.

- $d(x) = -\frac{10}{7x^3} = -\frac{10}{7}x^{-3}$

$D(x) = -\frac{10}{7} \times \frac{1}{-3+1}x^{-3+1}$ i.e. $D(x) = -\frac{10}{7} \times \frac{1}{-2}x^{-2}$

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i.e. $D(x) = \frac{5}{7x^2}$.

- $e(x) = \frac{-3}{(4x-1)^2} = -\frac{3}{4} \times \frac{4}{(4x-1)^2}$ forme $\frac{u'}{u^2}$

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$E(x) = -\frac{3}{4} \times \frac{-1}{4x-1}$ i.e. $E(x) = \frac{3}{4(4x-1)}$.

- $f(x) = 5 - e^{-3x-2} = 5 + \frac{1}{3} \times (-3)\, e^{-3x-2}$

2 $F(x) = 5x + \frac{1}{3}e^{-3x-2}$.

forme $\frac{u'}{u^2}$

- $g(x) = \frac{-36x+6}{(-3x^2+x+1)^2} = 6 \times \frac{-6x+1}{(-3x^2+x+1)^2}$

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$G(x) = 6 \times \frac{-1}{-3x^2+x+1}$ i.e. $G(x) = \frac{-6}{-3x^2+x+1}$.

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Exercice 2

$f(x) = 4x^2 - 1$.

• Les primitives de f sont les fonctions :

1 $F_k(x) = 4 \times \frac{1}{3} x^3 - x + k$, où $k \in \mathbb{R}$.

• $F_k(1) = 0 \iff 4 \times \frac{1}{3} \times 1^3 - 1 + k = 0$

$\iff \frac{4}{3} - 1 + k = 0$

2 $\iff k = -\frac{1}{3}$.

• Donc la primitive de f qui s'annule en 1 est :

1 $F(x) = \frac{4}{3} x^3 - x - \frac{1}{3}$.