TD Serie 2

ex 1 :

1) $f_1(x) = \dfrac{x}{\sqrt{1+x^2} - \sqrt{1+x}}$

$\Rightarrow \sqrt{1+x^2} - \sqrt{1+x} \neq 0$.

x should not be 0 or 1

$\Rightarrow$ x should not be $\{-1\} \cup$

$\Leftrightarrow D_{f_1} = \{]-1 ; +\infty[\setminus (0,1) \}$

$\left(D_{f_1} = \{]-1 ; 0[\cup]0 ; 1[\cup]1 ; +\infty[\setminus (0,1) \} \right.$

2) $f_2(x) = \ln(1+x^3) + x - 1$.

$D_{f_2} = \{]-1 ; +\infty[\}$

3) $f_3(x) = \dfrac{\ln(x)}{E(x^2) - 4} \geq 0$.

$\Leftrightarrow$ x doit être $\neq 2$.

$\Leftrightarrow D_{f_3} = \{]0 ; +\infty[\setminus (2, -2) \}$

$$f_4(x) = \sqrt{|x+2| - |2x-4|}$$

$$\Leftrightarrow |x+2| - |2x-4| \geq 0.$$

$$\Leftrightarrow |x+2| = |2x-4|$$

$$\Leftrightarrow x+2 = 2x-4$$

$$\Leftrightarrow x = 2x-4-2$$

$$\Leftrightarrow x = 2x-6$$

$$\lim_{0} \frac{x - \ln(1+x)}{x}$$

$$\Leftrightarrow x \left(\frac{1 - \ln(1+x)}{x} \right)$$

Les primitives :

$$\int x^n = \frac{x^{n+1}}{n+1}$$

ex :

- $f(x) = 5x^4$, $F(x) = \frac{5x^5}{5} = x^5$.) To verify the process.
- $\int (x) = x^3 - 2x$,

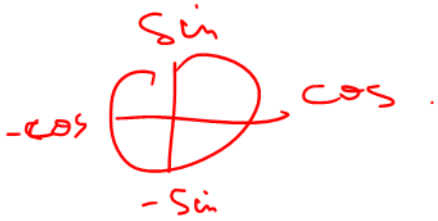
  $F(x) = \frac{x^4}{4} - x^2 + C$.
- $f(x) = 5x - 3 = \frac{5}{2}x^2 - 3x$.

Integrale :

I) Integration par partie :

Soit la formule suivante :

$$A = \int \underbrace{x}_{v} \underbrace{\sin(x)}_{u'} \, dx$$



$v = x$ ou $v' = 1^{b}$.

$u' = \sin(x)^{d}$ $\quad u = -\cos^{c}$.

$$A = a \cdot c - \int b \cdot c \, dx.$$

$$\Rightarrow A = -x\cos(x) - \int -\cos(x) \, dx.$$

$$= -x\cos(x) + \int \cos(x) \, dx.$$

$$= -x\cos(x) + \sin(x) + C$$

$C \Rightarrow$ constante