Primitives

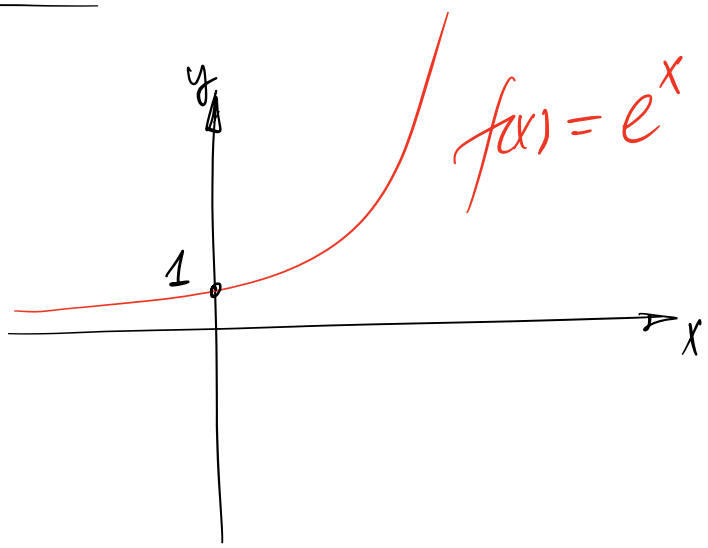
- polynômes ✓
- puissances ✓

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

- exponentielles
- sin ; cos
- comb. lin.
- composée ←
- log
- fract. elem. après div. eucl.

Fonction exponentielle

$$(e^x)' = e^x$$



$$\int e^x \, dx = e^x + C$$

$$\int \sin x \, dx = -\cos x + C$$

$$\int \cos x \, dx = \sin x + C$$

Combinaison linéaire

$$\int (3e^x + 4\cos x - 1 - x^2) \, dx =$$

$$3\int e^x \, dx + 4\int \cos x \, dx - \int (1 + x^2) \, dx =$$

$$3e^x + 4\sin x - \left(x + \frac{1}{3}x^3\right) + C$$

$$\int 3 \cdot e^x \, dx + \int 4\cos x \, dx - \int (1+x^2) \, dx$$

constante

$$3\int e^x \, dx + 4\int \cos x \, dx - \int (1+x^2) \, dx$$

Composée de 2 fonctions

$$(x^2+2)' = 2x$$

$$\left((x^2+2)^8\right)' = 8(x^2+2)^7 \cdot (x^2+2)' \qquad ()'$$

$$(T^8)' = 8T^7$$

$$= 8(x^2+2)^7 \cdot (2x)$$

$\int dx$

$$\int 8(x^2+2)^7 \cdot (2x)\, dx = (x^2+2)^8 + C$$

$()'$

$$\int T^7\, dT = \frac{1}{8}T^8 + C$$

$$\int (x^2-4x-5)^4 \cdot (2x-4)\,dx = \frac{1}{5}\cdot(x^2-4x-5)^5 + C$$

$(x^2-4x-5)' = 2x-4$ ✓

$\int T^4\,dT = \frac{1}{5}T^5 + C$

$()'$

$$\int (x^3+x)^{-3}\cdot(3x^2+1)\,dx = \frac{1}{1+(-3)}\cdot(\quad)^{-2} = -\frac{1}{2}(x^3+x)^{-2} + C$$

$()'$

$\int T^{-3}\,dT = \frac{1}{1+(-3)}\cdot T^{1+(-3)}$

$$\int \frac{1}{(x^2+1)^2}\cdot 2x\,dx = \int (x^2+1)^{-2}\cdot(2x) = -(x^2+1)^{-1} + C$$

$()'$

$$\int \frac{2\cdot x}{2\cdot(x^2+1)^3}\,dx = \frac{1}{2}\int (x^2+1)^{-3}\cdot 2x\,dx = \frac{1}{2}\cdot -\frac{1}{2}\cdot(x^2+1)^{-2} + C$$

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

$$\int \frac{1}{2}\cdot\frac{1}{(x^2+1)^3}\cdot\frac{2x}{1}\,dx =$$

$$\frac{1}{2}\int (x^2+1)^{-3}\cdot 2x\,dx$$

$$\int (x+1)^2\,dx = \left(\frac{1}{2}x^2+x\right)^2 + C$$

$()'$

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

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

$(u\cdot v)' = u'v + uv'$

$$= (x^2+2x)(x+1) \stackrel{?}{=} (x+1)^2$$

$(u\cdot v)^2 = u^2\cdot v^2$

$$= x^3+x^2+2x^2+2x \stackrel{?}{=} x^2+2x+1$$

$$\left((x^2-4x-5)^5\right)' = 5(x^2-4x-5)^4 \cdot (2x-4)$$