

Exo 1

$1; \int_{-2}^{-1} \frac{dx}{\sqrt{2-5x}}$, On pose $t = 2 - 5x$,

$$\int_{-2}^{-1} \frac{dx}{\sqrt{2-5x}} = \frac{-2}{5} \int \frac{dt}{2\sqrt{t}} = \frac{-2}{5} [\sqrt{2-5x}]_{-2}^{-1} = \frac{2}{5}\sqrt{12} - \frac{2}{5}\sqrt{7}$$

memme pour les autres , on pose $t = 4x + 5$, puis $t = x - 1$

$$\int x^2 \ln x dx = \frac{1}{3}x^3 \ln x - \frac{1}{9}x^3$$

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

$$\int x^2 \sin(4x) dx = \frac{1}{32} \cos 4x + \frac{1}{8}x \sin 4x - \frac{1}{4}x^2 \cos 4x$$

Exo 3

1. $\frac{d}{dx} (\tan(xy) + y) = y (\tan^2 xy + 1)$

$$\frac{d}{dy} (\tan(xy) + y) = x \tan^2 xy + x + 1$$

2. $\frac{d}{dx} \left(\frac{x+y}{1+x^2y} \right) = -\frac{1}{(y^2+1)^2} (x^2y + 2xy^2 - 1)$

$$\frac{d}{dy} \left(\frac{x+y}{1+x^2y} \right) = -\frac{x^3-1}{(y^2+1)^2}$$

3. $\frac{d}{dx} \left(e^{x+y+z} \ln \left(\frac{xz}{y} \right) \right) = \frac{1}{x} e^{x+y+z} \left(x \ln \frac{x}{y} z + 1 \right)$

$$\frac{d}{dy} \left(e^{x+y+z} \ln \left(\frac{xz}{y} \right) \right) = \frac{1}{y} e^{x+y+z} \left(y \ln \frac{x}{y} z - 1 \right)$$

$$\frac{d}{dz} \left(e^{x+y+z} \ln \left(\frac{xz}{y} \right) \right) = \frac{1}{z} e^{x+y+z} \left(z \ln \frac{x}{y} z + 1 \right)$$

4. $\frac{d}{dx} (\sqrt{x+y-1}) = \frac{d}{dy} (\sqrt{x+y-1}) = \frac{1}{2\sqrt{x+y-1}}$