Calculs d'intégrales

$\int \frac{\cos x\, dx}{1+\sin x}$ $\quad \int \frac{\sin x}{\cos x}\, dx$ $\quad \int \frac{dx}{\cos x}$ $\quad \int \frac{dx}{\sin x}$

$\int \sin^7 x \cos x\, dx$ $\quad \int \sin^7 x \cos^2 x\, dx$ $\quad \cdot \int \frac{e^{2x}+e^{x}+1}{e^{x}-e^{2x}}\, dx$

$\int \frac{e^{2t}\, dt}{1+e^{t}}$ $\quad \int_0^1 t^2\sqrt{1-t^2}\, dt \ (t=\sin u)$ $\quad \int_1^3 \frac{dx}{\sqrt{x}(x+3)} \quad \sqrt{x}=u$

~~Rappels~~

$\cdot \int x \sin x$ $\quad \int x \ln x$ $\quad \int \ln^2 x$ $\quad \int_{-1}^{+1} (1+x^3)^4 x^2\, dx$

$u = 1+x^3$

$\cdot \int_e^{e^2} \frac{dx}{x \ln^2 x} \quad t = \ln x$ $\quad \int_0^{\frac{\pi}{4}} \frac{\sin 2x}{1+\cos x}\, dx$

$\cdot \ I_n = \int_0^{\frac{\pi}{2}} \sin^n t\, dt \quad (n \in \mathbb{N})$

- Calculer I_0 et I_1
- Montrer que $I_n = \int_0^{\frac{\pi}{2}} \cos^n t\, dt$
- Montrer que $n I_n = (n-1) I_{n-2}$

En déduire I_{2n} et I_{2n+1}.

Fractions rationnelles

$\int \frac{x^4+x-1}{x^2+1}\, dx$ $\quad \int \frac{x\, dx}{(x-1)(x^2+1)}$

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

$\int \frac{2x^3-x}{(x-2)(x-1)}$ $\quad \int \frac{dx}{x^3-1}$

$\int \frac{dx}{x^2+x+1} \quad \left(x^2+x+1 = \left(x+\frac{1}{2}\right)^2+\frac{3}{4}\right)$

rappels

$x^2+x+1 = \left(x+\frac{1}{2}\right)^2+\frac{3}{4}$

$x^3-1 = (x-1)(x^2+x+1)$

$\int \frac{x^3\, dx}{x^2-x-6}$ $\quad \int \frac{dx}{x^3(x-1)^2}$

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