$$\int_a^b f(x)\,dx = F(x)\Big|_a^b = F(b) - F(a)$$

avec $F'(x) = f(x)$

Thm fond. du calc. diff. et int.

Tactique

1. Formulaire (formules directes / $\triangle$ trigo.)
2. Dérivée interne

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

identifier

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

$$\int \frac{1}{T}\, dT = \ln|T| + C$$

$$\ln|x^3+x^2+1| + C$$

$\frac{1}{t}$

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

$$\ln|x^3+x^2+1| + C$$

$$\int (2x-3)^2 \cdot 2 \; dx =$$

x^2

$$\int (2x-3)^2 \cdot \underbrace{(2x-3)'}\,dx =$$

$$\frac{1}{3}(2x-3)^3 + C$$

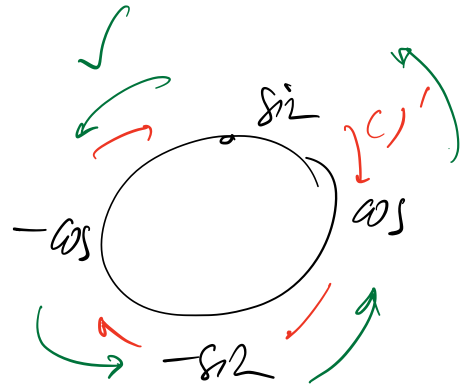
$$\int \cos(2x-3) \cdot 2 \; dx = \int \cos(2x-3) \cdot \underbrace{(2x-3)'}\,dx$$

$$= \sin(2x-3) + C$$

$$\int \sin(3-2x)\,dx =$$

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

$$-\frac{1}{2}\int \sin(3-2x)\cdot(3-2x)'\,dx =$$



$$-\frac{1}{2}\left(-\cos(3-2x)\right)+C = \frac{1}{2}\cos(3-2x)+C$$

$$A = \int_0^3 f(x)\,dx$$

$$\int_0^1 f(x)\,dx = 3$$

$$\int_1^3 f(x)\,dx = 8$$

$$\int_2^3 f(x)\,dx = -4$$

$$\int_a^b f(x)\,dx = \int_a^c f(x)\,dx + \int_c^b f(x)\,dx$$

$$\int_a^b f(x)\,dx = -\int_b^a f(x)\,dx$$

$$\int x^2 e^{x^3} dx = \int e^{x^3} \cdot x^2 dx = \int e^{x^3} \cdot 3x^2 \cdot \frac{1}{3} dx$$

$$= \frac{1}{3} \int e^{x^3} \cdot (x^3)' dx$$

$$\boxed{t = x^3} \Leftrightarrow \sqrt[3]{t} = x$$

$$\int e^t \cdot \left(\sqrt[3]{t}\right)^2 \cdot \frac{1}{3} t^{-\frac{2}{3}} \cdot dt$$

$$dt = 3x^2 dx$$

$$\left(\sqrt[3]{t}\right)' dt = dx$$

$$= \int e^t \cdot t^{\frac{2}{3}} \cdot t^{-\frac{2}{3}} \cdot \frac{1}{3} dt$$

$$\left(t^{1/3}\right)' dt = dx$$

$$= \int e^t \cdot t^0 \cdot \frac{1}{3} dt$$

$$\frac{1}{3} t^{\left(\frac{1}{3} - 1\right)} dt = dx$$

$$= \frac{1}{3} \int e^t dt = \frac{1}{3} e^t + C$$

$$\frac{1}{3} t^{-\frac{2}{3}} dt = dx$$

$$= \frac{1}{3} e^{x^3} + C$$