Clase 2

- Antiderivada

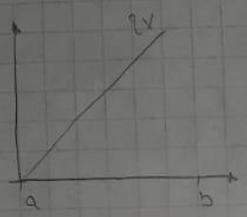
- F ⇔ antiderivada de f minuscula sobre algun intervalo I si $F'(x) = f(x)$ para todo x en I

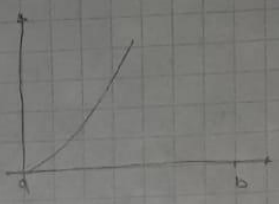
Si $f(x) = 2x$ ∴ $F' = 2x$

y $F(x) = x^2 + C$

- la antiderivada mas general $\boxed{F(x) + C}$

- Si $G'(x) = F'(x)$ ∀ x en $[a, b] \Rightarrow$
$G(x) = F(x) + C$ ∀ x en $[a, b]$





- EJEMPLOS

$f(x) = 2x + 5$ ① $F(x) = x^2 + 5x + C$

$f(x) = \operatorname{sen}^2(x)$

$F(x) = \ln(x) + C$

- Regla de la potencia para antiderivar

$\boxed{x^r \Rightarrow \frac{x^{r+1}}{r+1} + C}$

$f(x) = 4x^5$ $F(x) = \frac{4x^6}{6} + C = \frac{2x^6}{3} + C$

$f(x) = \sqrt[3]{x^2} = x^{2/3}$ $F(x) = \frac{x^{5/3}}{5/3} + C$

$f(x) = 1/x^2$ $F(x) = x^{-2+1} = x^{-1} + C = -\frac{1}{x} + C$

$f(x) = 8x^3 - 3x + 1$ $F(x) = \frac{8x^4}{4} - \frac{3x^2}{2} + 1x + C$

$F(x) = 2x^4 - \frac{3x^2}{2} + 1x + C$

$f(x) = x$ para derivar se coloca $\frac{d}{dx}$

$f(x) = dy$ $\quad dy = dx$

$F(x) = y$

$\frac{dy}{dx} : F(x) = y$

Resolver la ecuacion diferencial

$f'(x) = 6x^2 + x - 5$ con la condicion inicial

$f(0) = 2$

$y = 2x^3 + \frac{x^2}{2} - 5x + C$

$f(0) = 2(0)^3 + \frac{0^2}{2} - 5(0) + C = 2$

$f(0) = C = 2 \quad \therefore \quad C = 2$

$f(x) = 2x^3 + x^2 - 5x + 2$

La integral indefinida

Notacion $\int f(x)\, dx$ → operador diferencial

↳ integrando