$Q(t)$ t le temps (nombre)

Q pour QUANTITÉ (nombre)

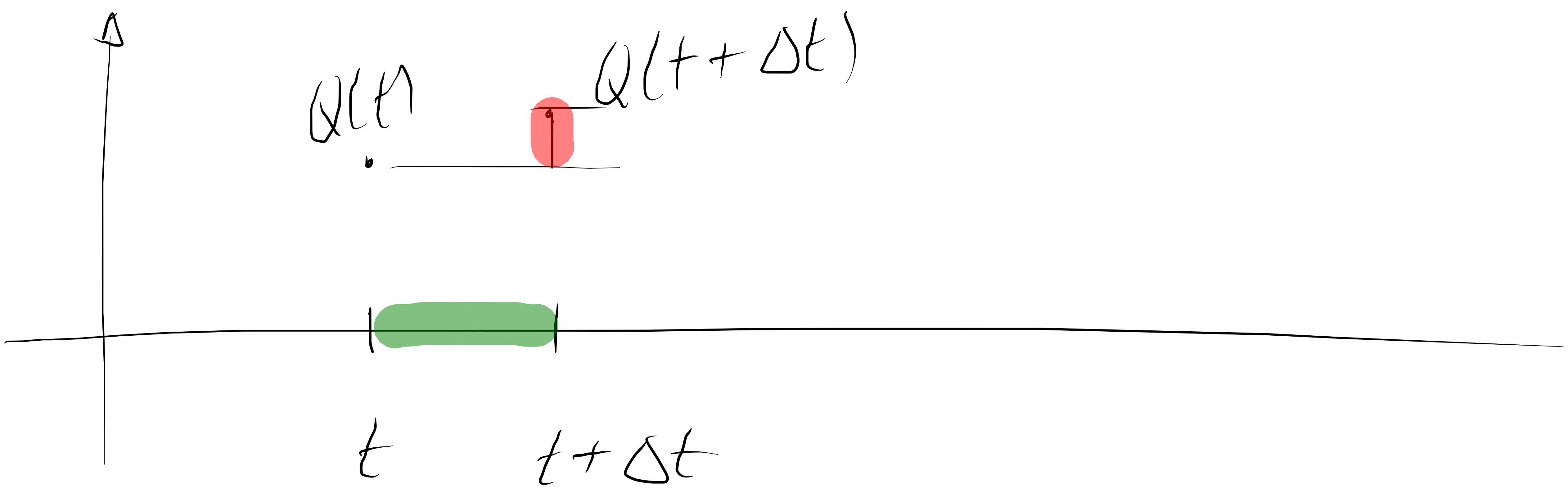
DÉRIVÉE

TAUX DE CHANGEMENT

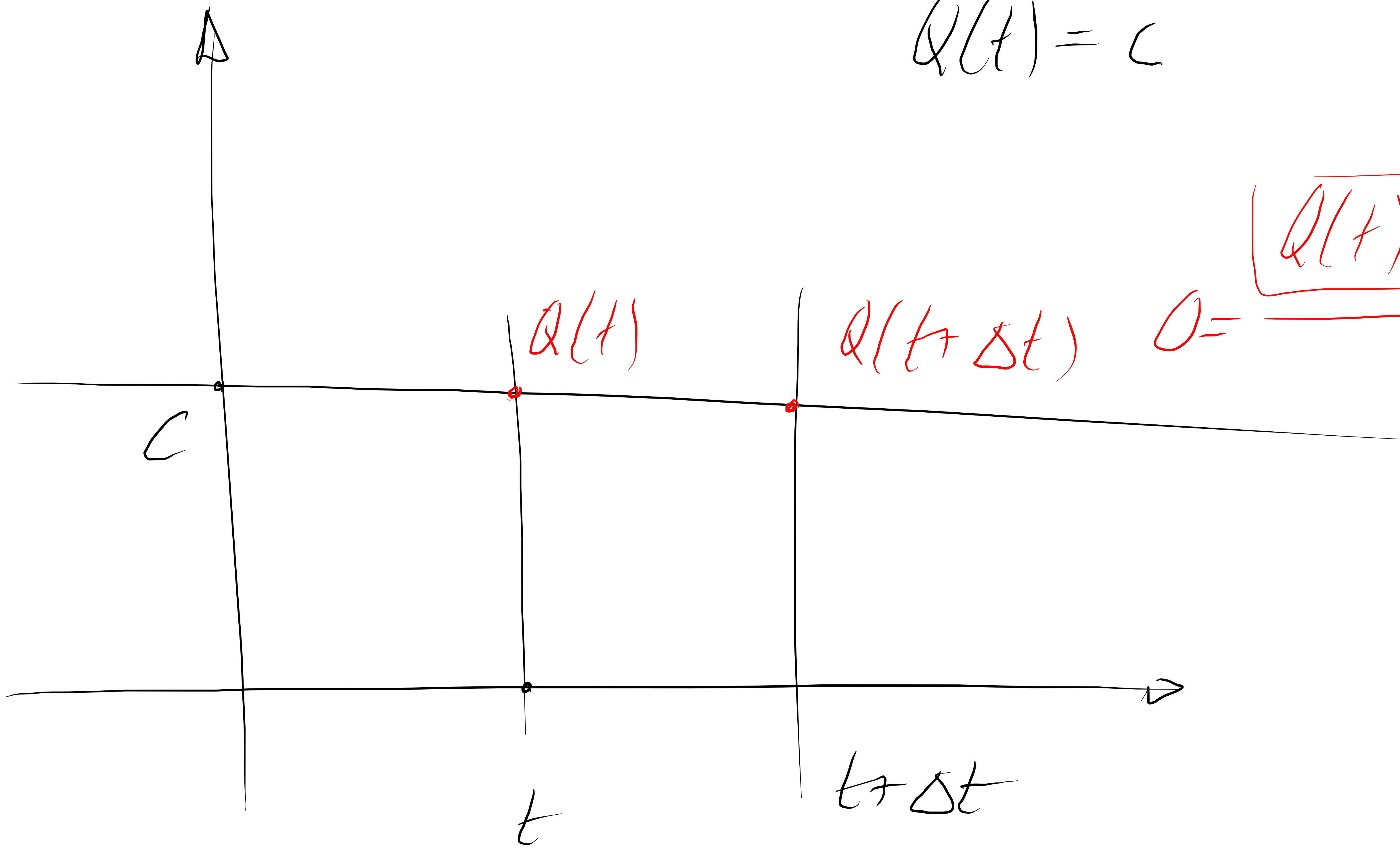
VITESSE « DU CHANGEMENT »

$$\frac{Q(t+\Delta t) - Q(t)}{\Delta t} \xrightarrow{\Delta t \to 0} \frac{dQ}{dt}(t)$$

Δt : « petit intervalle de temps »



$Q(t) = c$

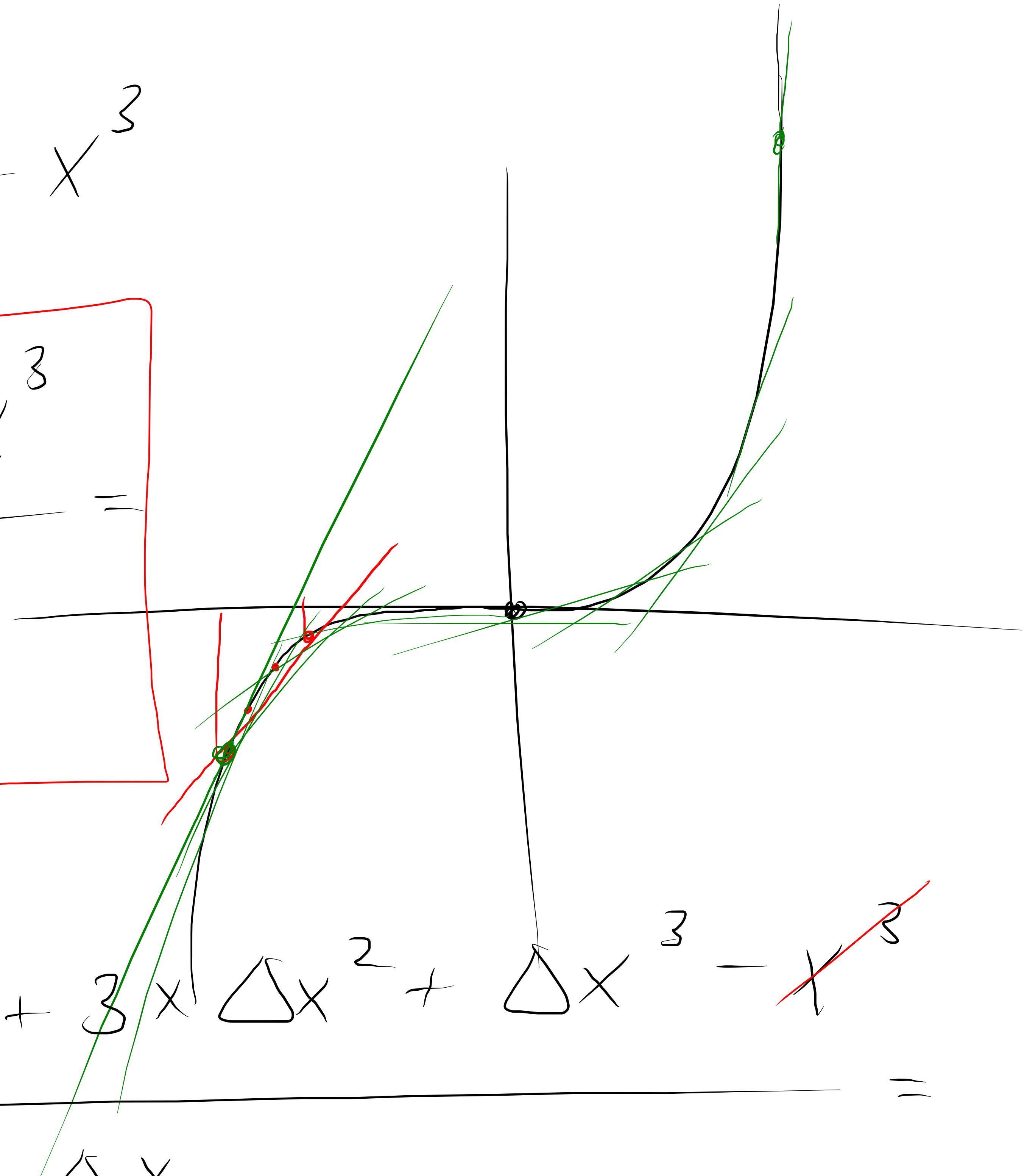


$$0 = \frac{\overbrace{\boxed{Q(t) - Q(t+\Delta t)}}^{0}}{\Delta t}$$

$$\Longrightarrow \quad Q(t) = c \quad \text{alors} \quad \frac{dQ}{dt}(t) = 0 \quad \forall t$$

$$f(x) = x^3$$

$$\boxed{\frac{(x+\Delta x)^3 - x^3}{\Delta x} =}$$



$$\frac{\cancel{x^3} + 3x^2\Delta x + 3x\Delta x^2 + \Delta x^3 - \cancel{x^3}}{\Delta x} =$$

$$\frac{\cancel{\Delta x}(3x^2 + 3x\Delta x + \Delta x^2)}{\cancel{\Delta x}} = 3x^2 + \boxed{3x\Delta x + \Delta x^2}$$

$$\lim_{\Delta x \to 0} (3x^2 + 3x\Delta x + \Delta x^2) = 3x^2$$