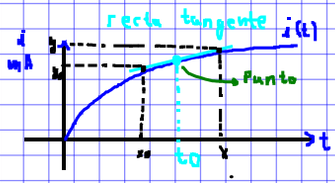
Clase 10.1 y 11.1 04.11.2022

Repaso Cálculo Diferencial

Derivada

★ Concepto Puntual



$v(t_0) = L \frac{d}{dt} i(t_0)$

$\frac{d}{dt} i(t_0) = m_1 = \frac{y - y_0}{x - x_0} = \frac{\Delta y}{\Delta x}$

$m = \frac{\Delta y}{\Delta x}$

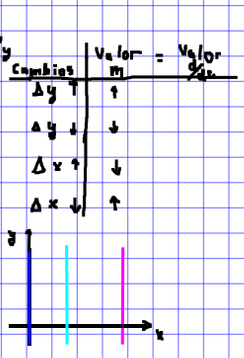
$\frac{0}{0} = ?$

$\lim_{\Delta x \to 0} \frac{\Delta y}{\Delta x} = m$

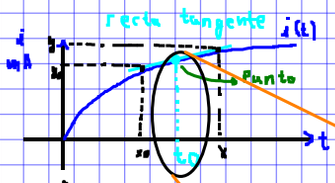
$\frac{d}{dt} f_1 > \frac{d}{dt} f_2$

$\lim_{\Delta x \to 0} m = m$

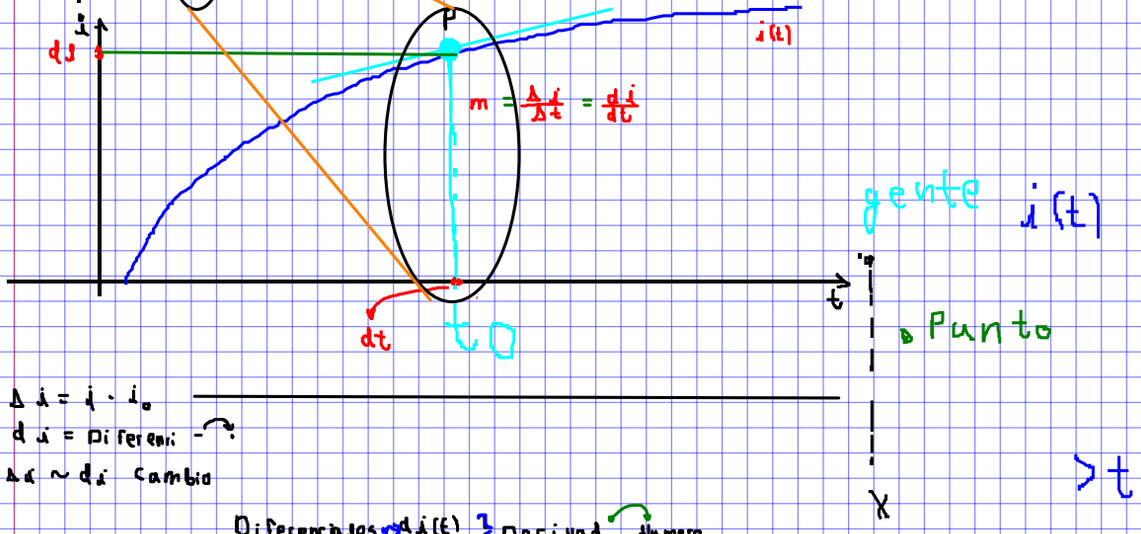
Función Creciente $\frac{d}{dt} f_1 > 0 \quad \frac{d}{dt} f_1 > 0$



Diferencial



recta tan



$\Delta i = i - i_0$

di = Diferencial

$\Delta i \sim di$ Cambio

Diferenciales $\frac{di(t)}{dt}$ } Derivada Numero

cambio infinitecimal — Razon (division) de Cambio

8.3 The Response of a First-Order Circuit to a Constant Input

P 8.3-28 After time $t = 0$, a given circuit is represented by the circuit diagram shown in Figure P 8.3-28.

(a) Suppose that the inductor current is

$$i(t) = 21.6 + 28.4e^{-4t}\,\text{mA} \quad \text{for } t \geq 0$$

Determine the values of R_1 and R_3.

(b) Suppose instead that $R_1 = 16\,\Omega$, $R_3 = 20\,\Omega$, and the initial condition is $i(0) = 10$ mA.
Determine the inductor current for $t \geq 0$.

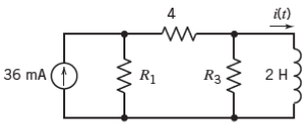
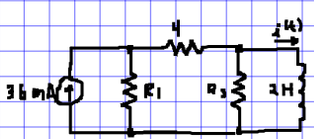


Figure P 8.3-28

Sol

a)



1)

1.a) $R_1 = ?$ $R_3 = ?$

$i(t) = 21.6 + 28.4\,e^{-4t}$ mA $t \geq 0$

$v(t) = L \frac{d}{dt} i(t)$

1.b) $R_1 = 16\,\Omega$ $R_3 = 20\,\Omega$

$i(0) = 10$ mA

$i(t) = ?$ $t \geq 0$

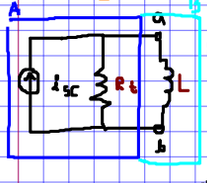
T. Norton R_t, L, C Source

$R_t = ?$

$i_{sc} = ?$

$\tau = \frac{L}{R_t} = ?$ $i(t) = 21.6 + 28.4\,e^{-4t}$ mA.

$i(0) = ?$



Equivalent Norton

2) Label