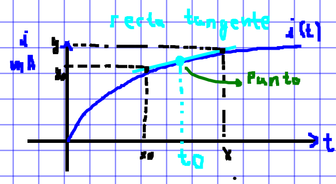
Clase 10 y 11 04.11.2022

Repaso Cálculo Diferencial

Derivada

* Concepto Puntual

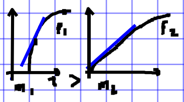


$v(t_0) = L \frac{d}{dt} i(t_0)$

$\frac{d}{dt} i(t_0) = m_1 = \frac{Y - Y_0}{X - X_0} = \frac{\Delta y}{\Delta x}$

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

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



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

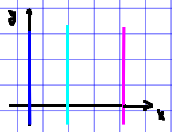
$\lim_{\Delta x \to 0} m = \infty$

$\frac{d}{dt} F_1 > \frac{d}{dt} F_2$

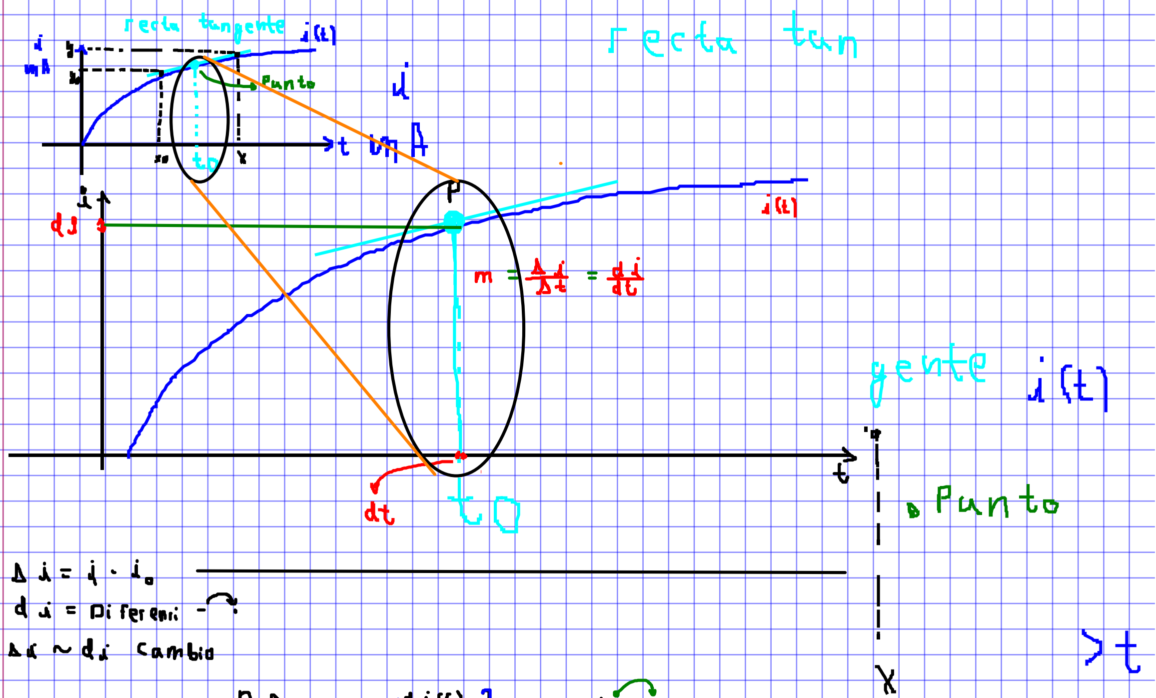
Función Creciente $\frac{d}{dt} F_1 > 0$ $\frac{d}{dt} F_1 > 0$

F(t)

Cambios	Valor m	= Valor $\%$
$\Delta y \uparrow$	$\uparrow$	
$\Delta y \downarrow$	$\downarrow$	
$\Delta x \uparrow$	$\downarrow$	
$\Delta x \downarrow$	$\uparrow$	



Diferencial



$\Delta i = i - i_0$

$d\, i$ = Diferencial

$\Delta i \sim d i$ cambio

Diferenciales $\frac{d\, i(t)}{dt}$ Derivada Numero

cambio infinitecimal

Razon (división) 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 $t \geq 0$.

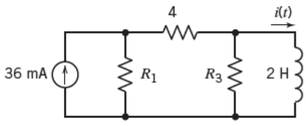
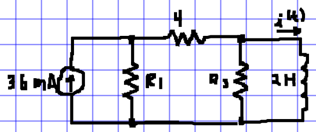


Figure P 8.3-28

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

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

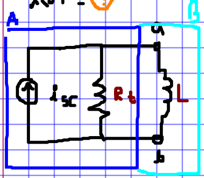
E. Norton R_t, L, C Soucrce

$R_t = ?$

$i_{sc} = ?$

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

$i(0) = ?$



Equivalent Norton

2) Label