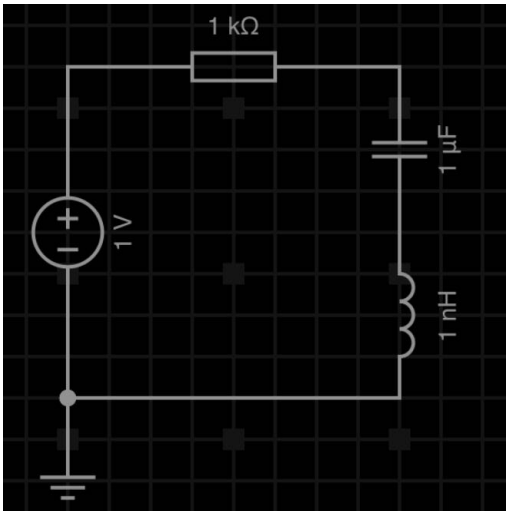
Análisis de sistemas lineales
Martha Hernández Jara
Tarea #3

Circuito RLC:



El circuito mostrado anteriormente, tiene la siguiente función de transferencia y se debe graficar cada entrada ante un impulso, un escalón unitario y una rampa.

$$\frac{V_{out}(S)}{V_{in}(S)} = \frac{L * S^2}{L * S^2 + R * S + \frac{1}{C}}$$

FORMULAS:

- IMPULSO

$$V_{out}(S) = \frac{L * S^2}{L * S^2 + R * S + \frac{1}{C}} * 1$$

$$V_{out}(S) = \frac{L * S^2}{L * S^2 + R * S + \frac{1}{C}}$$

- RAMPA

$$V_{out}(S) = \frac{L * S^2}{L * S^2 + R * S + \frac{1}{C}} * \frac{1}{S^2}$$

$$V_{out}(S) = \frac{L}{L * S^2 + R * S + \frac{1}{C}}$$

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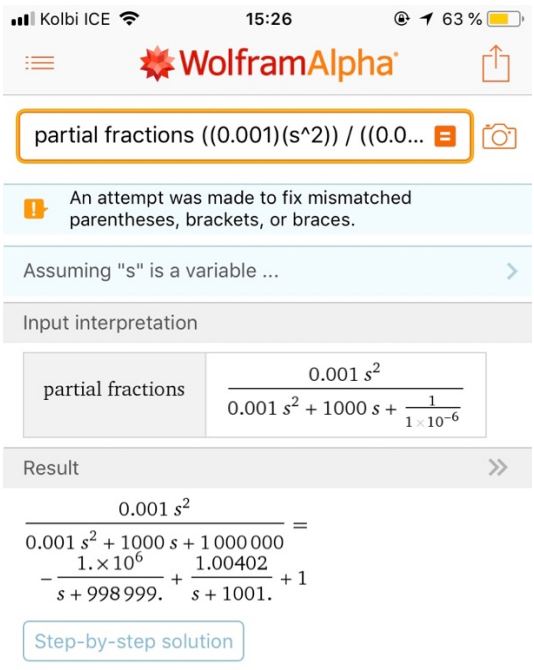
- ESCALÓN UNITARIO

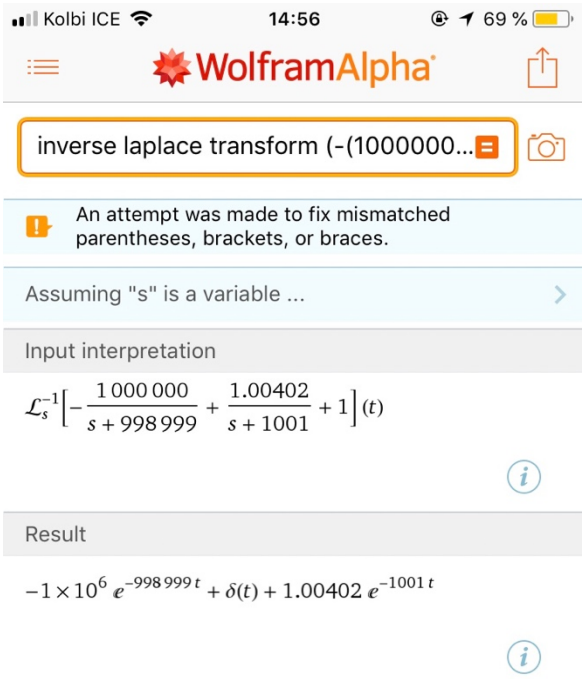
$$V_{out}(S) = \frac{L * S^2}{L * S^2 + R * S + \frac{1}{C}} * \frac{1}{S}$$

$$V_{out}(S) = \frac{L * S}{L * S^2 + R * S + \frac{1}{C}}$$

Utilizando el programa Wolfram Alpha se obtiene las fracciones parciales y la transformada inversa de Laplace en cada uno de los casos.

- IMPULSO





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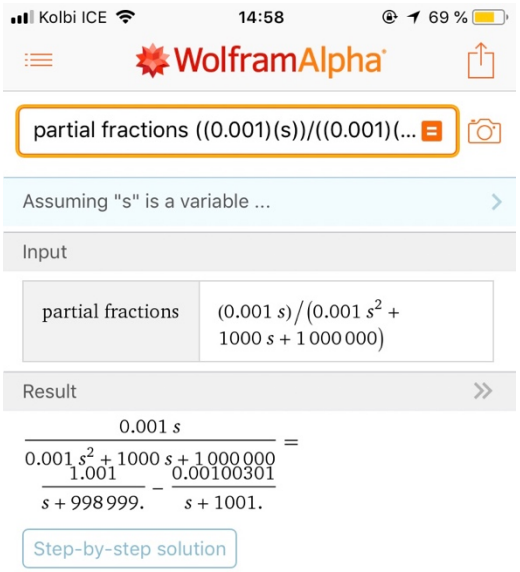
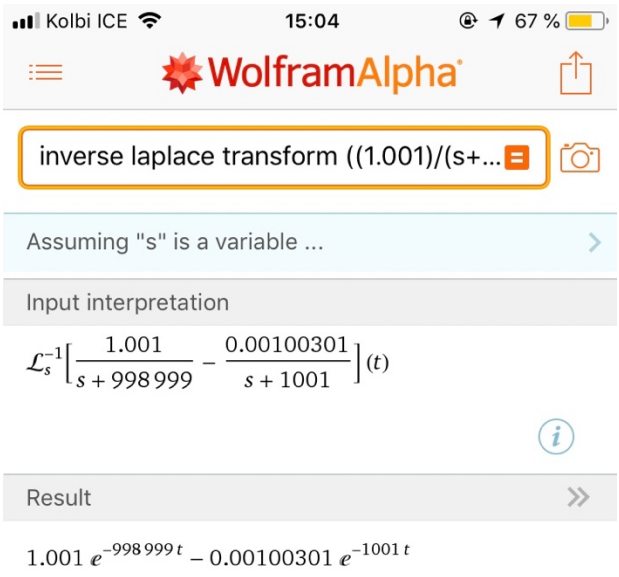
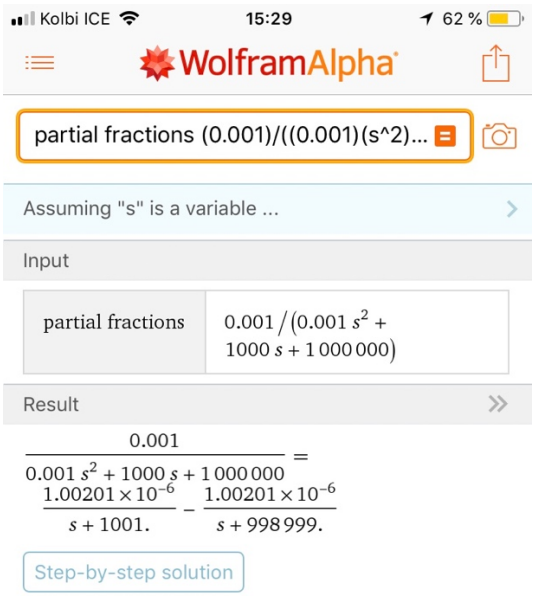
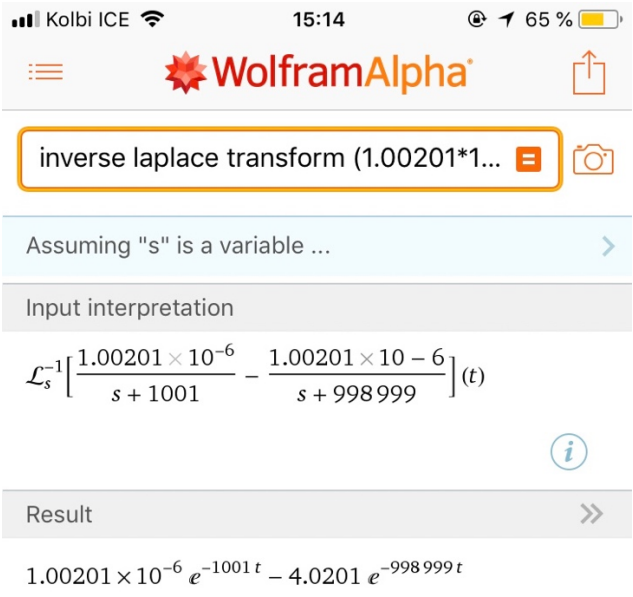




- RAMPA





NOTA:
En todos los procedimientos anteriores se utilizan: L= 1mH, R= 1kΩ y C= 1μF.
(Datos brindados por el profesor en la clase)

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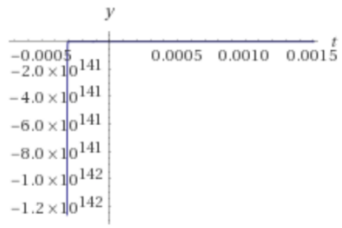
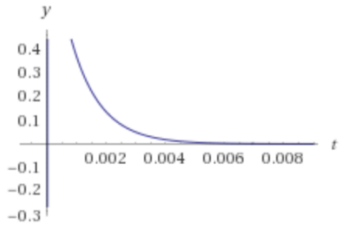
Utilizando el mismo programa se obtienen las siguientes graficas para cada caso.

- IMPULSO

Plots:



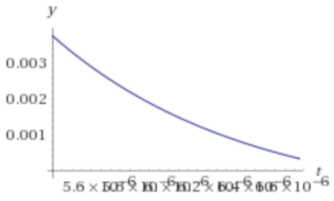
(t from -7×10^{-4} to 0.002)



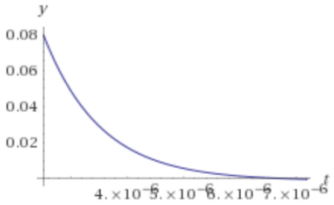
(t from -7×10^{-4} to 0.009)

- ESCALÓN UNITARIO

Plots:



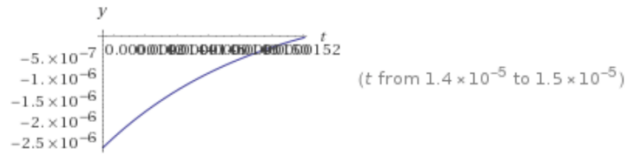
(t from 5.4×10^{-6} to 6.6×10^{-6})



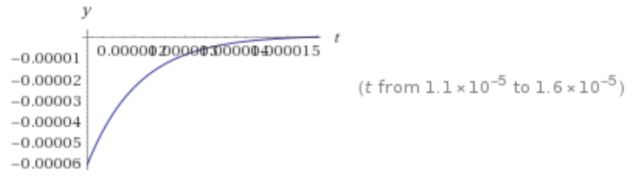
(t from 2.5×10^{-6} to 7.2×10^{-6})

- RAMPA

Plots:



(t from 1.4×10^{-5} to 1.5×10^{-5})



(t from 1.1×10^{-5} to 1.6×10^{-5})