

worksheet 6.3.1 page 1

$$R_o := 100$$

$$R_g := 10$$

$$R_L := 0$$

$$V_{gen} := 10$$

$$\underline{T} := 100 \cdot 10^{-9}$$

$$N_1 := 100 \quad \underline{dt} := \frac{T}{N_1}$$

$$N_2 := 30 \cdot N_1$$

$$\text{send}(\text{INPUT}, V_{gen}) := \left| \begin{array}{l} \text{Ini} \leftarrow \text{INPUT}_2 \\ \text{Ina} \leftarrow \frac{2 \cdot R_o \cdot \text{Ini} + V_{gen}}{R_g + R_o} \\ \text{Inr} \leftarrow \text{Ina} - \text{Ini} \\ \left(\begin{array}{c} \text{Ina} \\ \text{Inr} \end{array} \right) \end{array} \right.$$

$$\text{recv}(\text{INPUT}) := \left| \begin{array}{l} \text{Ifi} \leftarrow \text{INPUT}_1 \\ \text{Ifa} \leftarrow \frac{2 \cdot R_o \cdot \text{Ifi}}{R_L + R_o} \\ \text{Ifr} \leftarrow \text{Ifa} - \text{Ifi} \\ \left(\begin{array}{c} \text{Ifa} \\ \text{Ifr} \end{array} \right) \end{array} \right.$$

$$\text{point}(n) := \left| \begin{array}{l} m \leftarrow \text{mod}(n, N_1) \\ m \leftarrow N_1 \quad \text{if } m = 0 \end{array} \right.$$

$$\text{Iline} := \left| \begin{array}{l} \text{data}_2, N_1 \leftarrow 0 \\ \text{for } i \in 1 \dots N_2 \\ \quad \left| \begin{array}{l} p \leftarrow \text{point}(i) \\ \text{INPUT} \leftarrow \text{data}^{\langle p \rangle} \\ \left(\begin{array}{c} \text{Ina} \\ \text{Inr} \end{array} \right) \leftarrow \text{send}(\text{INPUT}, V_{gen}) \\ \left(\begin{array}{c} \text{Ifa} \\ \text{Ifr} \end{array} \right) \leftarrow \text{recv}(\text{INPUT}) \\ \text{OUTPUT} \leftarrow \left(\begin{array}{c} \text{Inr} \\ \text{Ifr} \end{array} \right) \\ \text{data}^{\langle p \rangle} \leftarrow \text{OUTPUT} \\ \text{I}_i \leftarrow \text{Ina} \end{array} \right. \\ \text{I} \end{array} \right.$$

$$n := 1 \dots N_2$$

$$t_n := (n - 1) \cdot dt$$

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(page 1 of worksheet is a copy of figure 6.2.5 with the value of RL set at zero)

$$R_g = 10 \quad \Omega$$

$$R_L = 0 \quad \Omega$$

$$dt = 1 \times 10^{-9} \quad s$$

$$V_{gen} = 10 \quad V$$

$$L := T \cdot R_o = 1 \times 10^{-5} \quad H$$

$$I := 0 \quad A$$

$$\text{next}(I) := \begin{cases} dI \leftarrow \frac{dt}{L} \cdot (V_{gen} - R_g \cdot I) \\ I \leftarrow I + dI \end{cases}$$

$$I_{ind}_n := \begin{cases} I \leftarrow \text{next}(I) \\ I \end{cases}$$

Figure 6.3.3 Calculating response of model of figure 6.3.2.

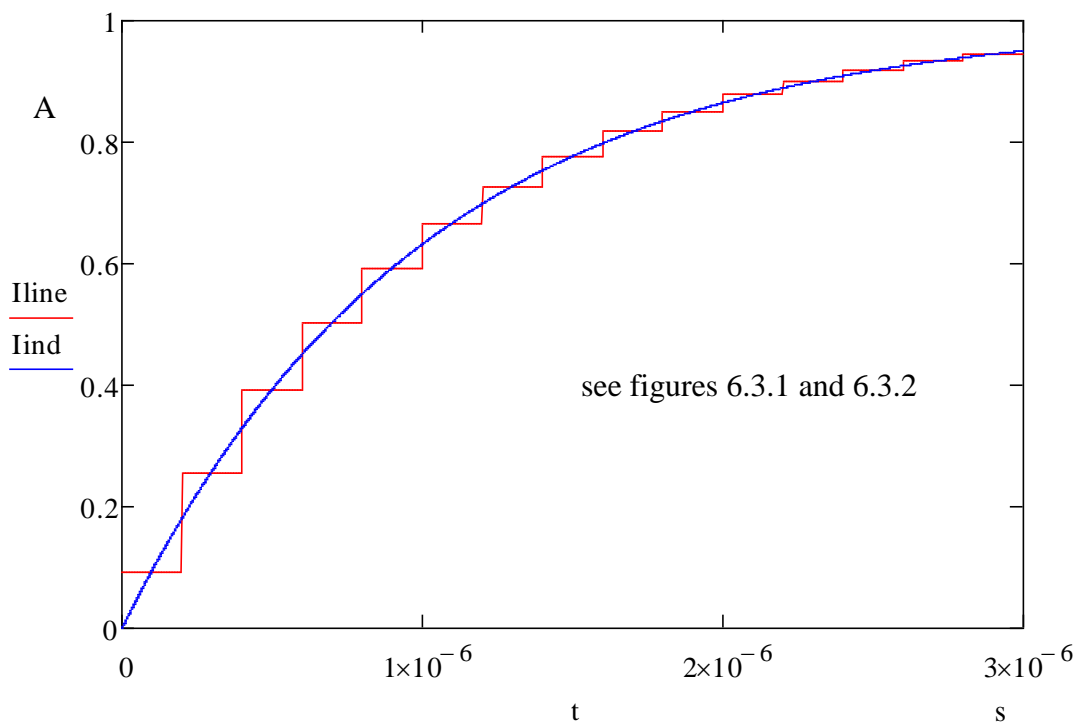


Figure 6.3.4 Response of short-circuited line and 10 micro-H inductor

