

Ausschalten eines RL-Kreises - Theorie - Lösung

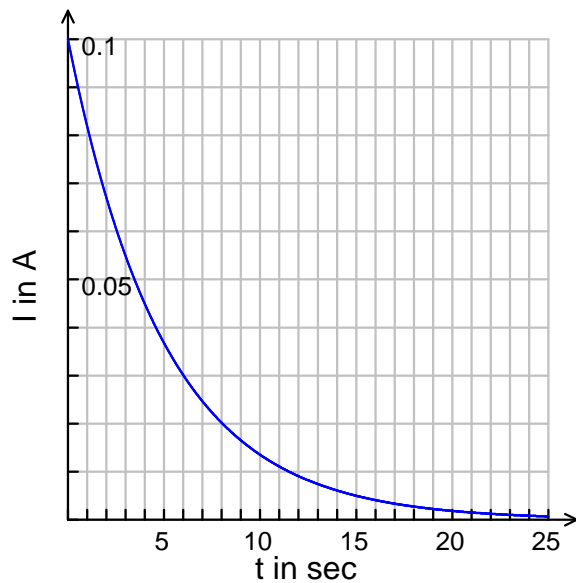
1.a)

$$I(t) := I_0 \cdot \exp\left(\frac{-R}{L}t\right) \quad \text{"Done"} \quad I_0 := \frac{-U_0}{R} \quad \frac{-u_0}{r}$$

$$\frac{d}{dt}(I(t)) + \frac{R}{L}I(t) = 0 \quad \text{true}$$

b)

$$R := 1E2 \quad 100. \quad L := 5E2 \quad 500. \quad U_0 := -10 \quad -10$$



$$\text{delvar}(R) \quad \text{"Done"} \quad \text{delvar}(L) \quad \text{"Done"} \quad \text{delvar}(U_0) \quad \text{"Done"}$$

c)

$$I(0) = \frac{-u_0}{r}$$

d)

$$\lim_{t \rightarrow \infty} (I(t)) = 0$$

e)

$$\text{round}\left(\frac{I\left(\frac{L}{R}\right)}{I_0}, 2\right) \quad .37$$

f)

$$\text{solve}\left(I(t) = \frac{1}{2} \cdot I_0, t\right) \quad t = \frac{L \cdot \ln(2)}{r}$$

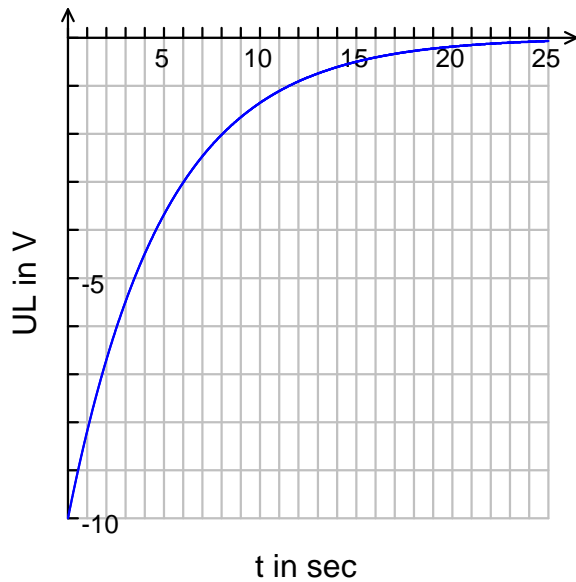
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2.a)

$$UL(t) := L \frac{d}{dt} (I(t)) \quad \text{"Done"} \quad UL(t) \quad u0 \cdot e^{(-r \cdot t)/l}$$

b)

$$R := 1E2 \quad 100. \quad L := 5E2 \quad 500. \quad U0 := -10 \quad -10$$



$$\text{delvar}(R) \quad \text{"Done"} \quad \text{delvar}(L) \quad \text{"Done"} \quad \text{delvar}(U0) \quad \text{"Done"}$$

c)

$$UL(0) \quad u0$$

d)

$$\lim_{t \rightarrow \infty} (UL(t)) = 0$$

e)

$$\text{round}\left(\frac{UL\left(\frac{L}{R}\right)}{U0}, 2\right) \quad .37$$

f)

$$\text{solve}\left(UL(t) = \frac{1}{2} \cdot U0, t\right) \quad t = \frac{l \cdot \ln(2)}{r}$$

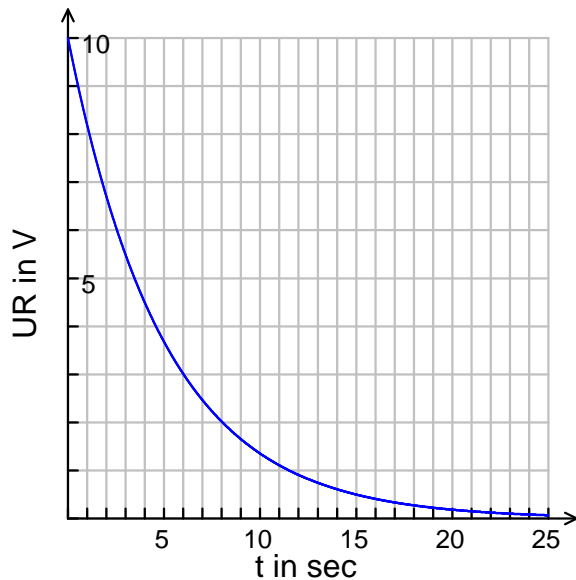
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3.a)

$$UR(t) := RI(t) \quad \text{"Done"} \quad UR(t) \quad -u0 \cdot e^{(-r \cdot t)/l}$$

b)

$$R := 1E2 \quad 100. \quad L := 5E2 \quad 500. \quad U0 := -10 \quad -10$$



$$\text{delvar}(R) \quad \text{"Done"} \quad \text{delvar}(L) \quad \text{"Done"} \quad \text{delvar}(U0) \quad \text{"Done"}$$

c)

$$UR(0) \quad -u0$$

d)

$$\lim_{t \rightarrow \infty} (UR(t)) = 0$$

e)

$$\text{round}\left(\frac{UR\left(\frac{L}{R}\right)}{-U0}, 2\right) \quad .37$$

f)

$$\text{solve}\left(UR(t) = \frac{1}{2}(-U0), t\right) \quad t = \frac{l \cdot \ln(2)}{r}$$