

## Homework Assignment #9 - Inductors

### Reading Assignment:

Chapter 6 in Electric Circuits, 8<sup>th</sup> Edition by Nilsson

### Problem Assignment:

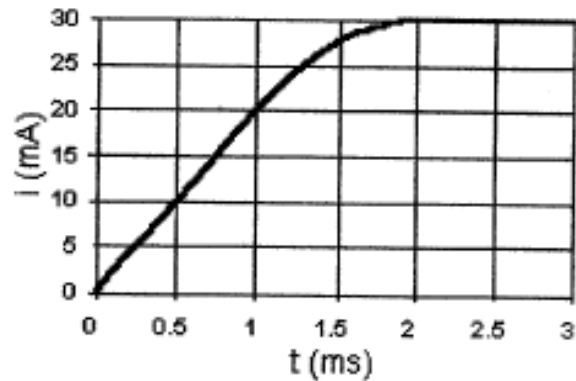
*Note: Be sure to follow the required PROBLEM FORMAT for every assignment in this course.*

Ch. 6 problems: 1, 2, 5, 8, 21, 22, 33

### Selected Answers:

6.2) a)  $i(t) = \begin{cases} 20t \text{ A} & \text{for } 0 \leq t \leq 1 \text{ ms} \\ 40t - 10,000t^2 - 0.01 \text{ A} & \text{for } 1 \text{ ms} \leq t \leq 2 \text{ ms} \\ 30 \text{ mA} & \text{for } 2 \text{ ms} \leq t \leq \infty \end{cases}$

[b]



6.5) a)  $i(t) = \begin{cases} -5t^2 \text{ A} & \text{for } 0 \leq t \leq 2 \\ 5t^2 - 40t + 40 \text{ A} & \text{for } 2 \leq t \leq 6 \\ 80t - 5t^2 - 320 \text{ A} & \text{for } 6 \leq t \leq 10 \\ 5t^2 - 120t + 680 \text{ A} & \text{for } 10 \leq t \leq 12 \\ -40 \text{ A} & \text{for } 12 \leq t \leq \infty \end{cases}$

b)  $v(t) = 0$  at  $t = 0, 4, 8,$  and  $12$ , so  $i(0) = 0 \text{ A}, i(4) = -40 \text{ A}, i(8) = 0 \text{ A}, i(12) = -40 \text{ A}$

6.8) a)  $v(t) = -60e^{-2,000t} + 120e^{-8,000t} \text{ V}$     b)  $t = 115.52 \text{ us}$

6.33)  $v_o(t) = 700e^{-80t} \sin(60t) \text{ V}$