

GEORGIA INSTITUTE OF TECHNOLOGY
School of Electrical and Computer Engineering

Course ECE 2040
Circuit Analysis

Assigned: October 13, 2000

Due: October 20, 2000

Problem Set #8

Reading: Read the following sections from the class notes:

Chapter 6, Section 6.2, 6.3

Reading: Read the following sections from Dorf and Svoboda:

Chapter 14, Section 14.6, 14.7; (Circuits in Laplace Domain)

Chapter 8, Sections 8.3, 8.6. (Inspection methods)

Problem 8.1: Determine $v_{out}(t)$ for $t > 0$ for the circuit in Figure 1 if $v_{out}(0) = 0$.

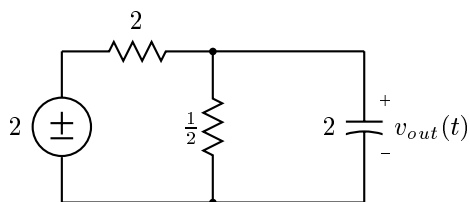


Figure 1: Circuit for Problem 8.1.

Problem 8.2: (a) For the circuit in Figure 2, determine $v_c(t)$ if $i_s(t) = 1$ for $t > 0$ under the assumption that $v_c(0) = 0$.

(b) Repeat for $v_c(0) = 1$.

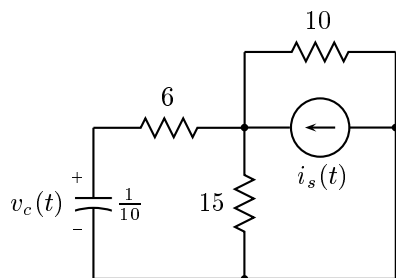
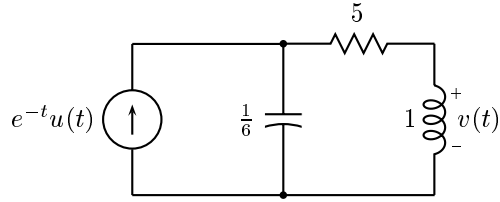
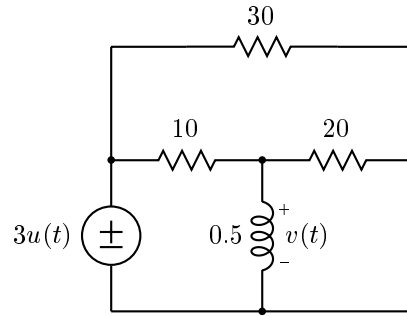


Figure 2: Circuit for Problem 8.2.

Problem 8.3: In the circuit below solve for $v(t)$ for $t > 0$ if $v_c(0) = 0$ and $i_\ell(0) = 0$, where $v_c(t)$ is the voltage drop across the capacitor and $i_\ell(t)$ is the current through the inductor.



Problem 8.4: Consider the first-order circuit below



- (a) Find $v(0)$.
- (b) Find $v(\infty)$.
- (c) Find $v(t)$ for $t > 0$.

Problem 8.5: The circuit in Figure 3 is at initial rest, i.e. the capacitor voltage is zero at $t = 0$, and $v_s(t) = 1$ for $t > 0$.

- (a) Determine $v_{out}(0)$.
- (b) Determine $v_{out}(\infty)$.
- (c) Determine $v_{out}(t)$ for all t .

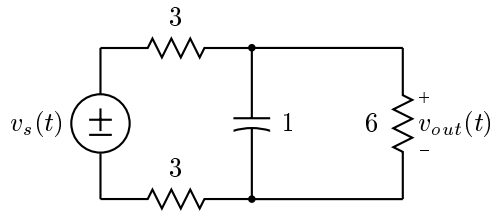


Figure 3: Circuit for Problem 8.5.