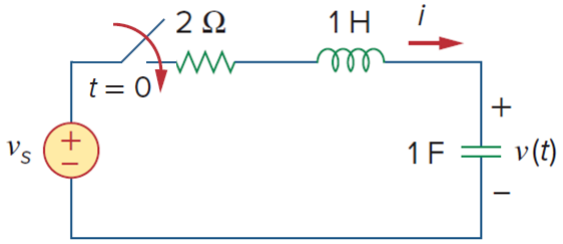
Assignment 11

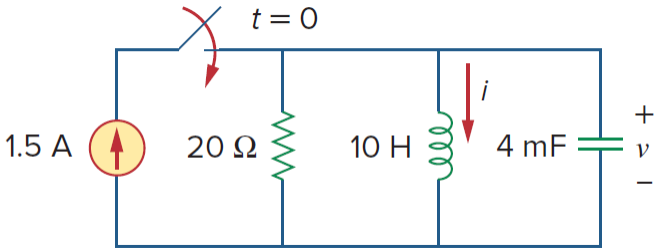
1. The initial energy stored in the following circuit is zero. The switch is closed at $t = 0$. Assume $V(s) = \mathcal{L}\{v(t)\}$ and $I(s) = \mathcal{L}\{i(t)\}$.



If $v_s(t) = 10\ V$,

   a. Write the differential equations in terms of $v(t)$ and $i(t)$.
   b. Find $V(s)$ and $I(s)$.
   c. Find $v(t)$ and $i(t)$.
   d. Find zeros and poles of $V(s)$ and $I(s)$.
   e. Use the initial value theorem to find $v(0^+)$ and $i(0^+)$ from $V(s)$ and $I(s)$.
   f. Use the final value theorem to find $v(\infty)$ and $i(\infty)$ from $V(s)$ and $I(s)$.
   g. Do your answers in (e) and (f) make sense in the terms of the above circuit behavior? Please explain.

2. The initial energy stored in the following circuit is zero. The switch is closed at $t = 0$. Assume $V(s) = \mathcal{L}\{v(t)\}$ and $I(s) = \mathcal{L}\{i(t)\}$.



   a. Write the differential equations in terms of $v(t)$ and $i(t)$.
   b. Find $V(s)$ and $I(s)$.
   c. Find $v(t)$ and $i(t)$.
   d. Find zeros and poles of $V(s)$ and $I(s)$.
   e. Use the initial value theorem to find $v(0^+)$ and $i(0^+)$ from $V(s)$ and $I(s)$.
   f. Use the final value theorem to find $v(\infty)$ and $i(\infty)$ from $V(s)$ and $I(s)$.
   g. Do your answers in (e) and (f) make sense in the terms of the above circuit behavior? Please explain.