John F. Kennedy
(May 29, 1917-November 22, 1963)

University ☺f P☺rtland
Sch☺☺l ☺f Engineering

EE 261-Electrical Circuits-3 cr. hrs.
Fall 2013

Midterm Exam # 3

(Friday, November 22, 2013)
President JFK was killed 50 years ago, on this day.

(Closed Book Exam, Three Formula Sheet are Allowed)
(Total Time: 55 minutes)

Name:_____☺

Signature:_____☺

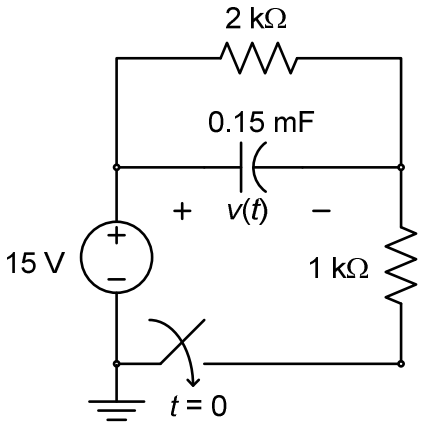
"An honest mind possesses a kingdom."
Lucius Annaeus Seneca (4B.C.–65A.D.)

"Honest people are the true winners of the universe."
Anonymous

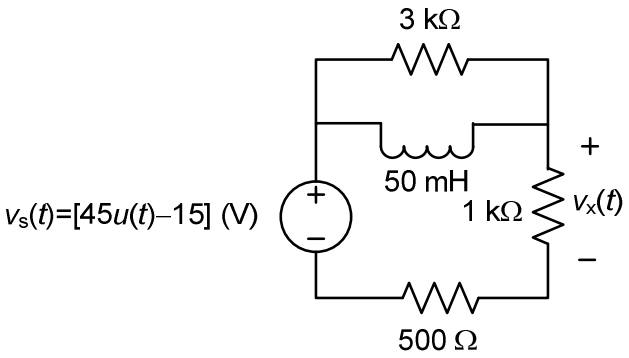
NOTE: Problem # 4 is take-home, due Monday. On all the problems, please show your work clearly, and provide the appropriate units for your answers. Also mark on the schematic to show any current or voltage that you define in your solution.

P # 1 (25 pts.)	P # 2 (25 pts.)	P # 3 (25 pts.)	P # 4 (25 pts.)	Total (100 pts.)

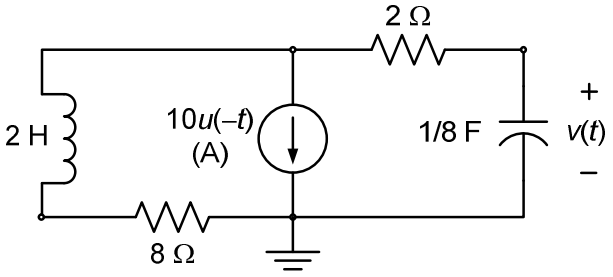
1. (15 mins., 25 points) In the electric circuit shown, the switch closes at $t = 0$, after being open for a long time. Find the complete mathematical expression for the voltage $v(t)$ across the 0.15 mF capacitor for $t \geq 0$. (Please show your work clearly and provide brief justifications for the steps you take. Also, don't forget to provide the correct units for your answer.)



2. (15 mins., 25 points) In the electric circuit shown, find the complete mathematical expression and <u>sketch</u> the voltage $v_x(t)$ across the 1 kΩ resistor for $t > 0$. (Please show your work step by step.)

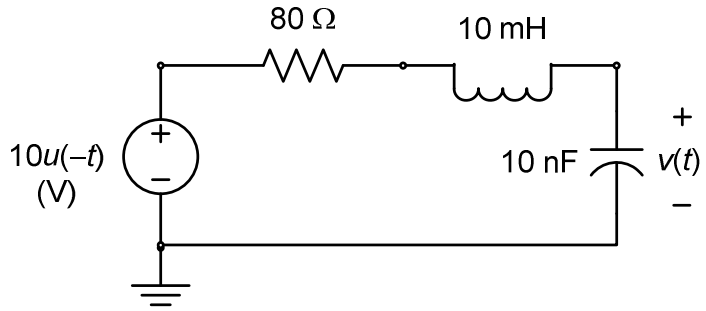


3. (20 mins., 25 points) Consider the electric circuit shown. Solve for the complete mathematical expression for the capacitor voltage $v(t)$ for $t \geq 0$. Show your work step by step including justifications.



(4) (Take-home: Total: 25 points)

(a) (15 points) For the electric circuit shown, find the complete mathematical expression for voltage $v(t)$ across the 10 nF capacitor for $t \geq 0$. Show your work including justifications step by step.



(b) (10 points) Repeat part (a) if the source voltage is changed from $10u(-t)$ to $10u(t)$.