EE2210 Electric Circuits   **Fall 2022**
Homework 3 (Lecture 6-7)
Total points: 100

Please write down clearly the calculation/thinking process of each question. Unit is needed when applicable.

Due: December 5th, 10:10am

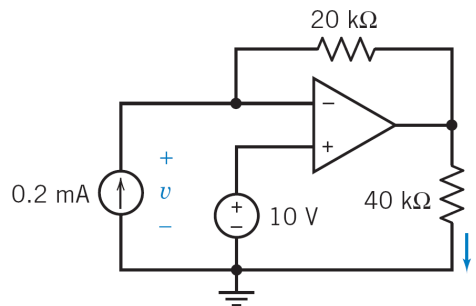1. Determine i and v for the circuit in Figure 1. (16%)

Figure 1.

2. Determine v_a and v_o for the circuit in Figure 2. (15%)
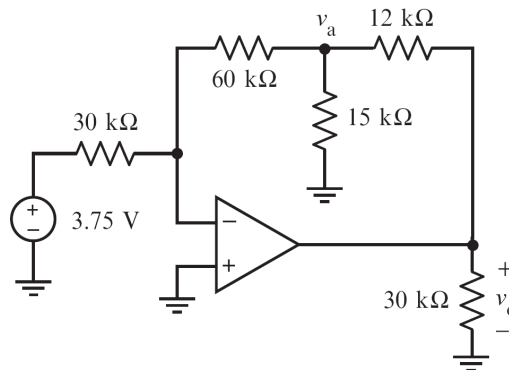
Figure 2.

3. Design the operational amplifier in Figure 3 such that $v_o = 5v_{in}$. (15%)
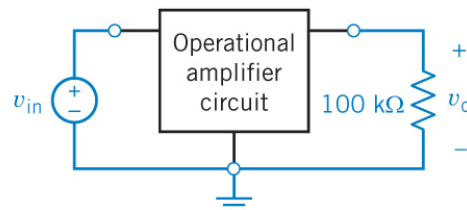
Figure 3.

4. Determine and plot $v_{out}(t)$ for the circuit in Figure 4(a) and 4(b). The input is a 10-V
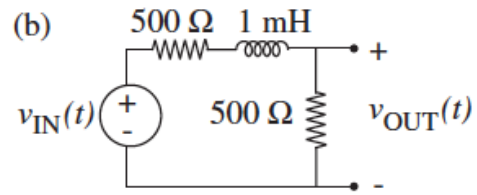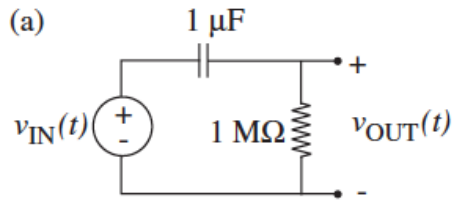
step function, $v_{in}(t) = 10*u(t)$. (18%)

(a)   1 μF

$v_{IN}(t)$ 1 MΩ $v_{OUT}(t)$

(b)   500 Ω   1 mH

$v_{IN}(t)$ 500 Ω $v_{OUT}(t)$

Figure 4.

5. Determine and plot $v_{out}(t)$ for the circuits in Figure 4(a) and 4(b) assuming the input is a 10-V ramp function, that is $v_{in}(t) = 0$ for t < 0 and $v_{in}(t) = 10*t$ for t ≥ 0. (18%)

6. Determine and plot $v_{out}(t)$ for the circuits in Figure 4(a) and 4(b) assuming the input is a 10-V impulse function, that is $v_{in}(t) = 10*\delta(t)$. (18%)