

ECE 35, Spring 2020

Quiz 3

/ 10

Last name

First + middle
name(s)

PID

(1) (5 points)

Find steady state current $i_a(t)$.

$$V_1 = 2 \text{ V}$$

$$I_1 = 1 \text{ A}$$

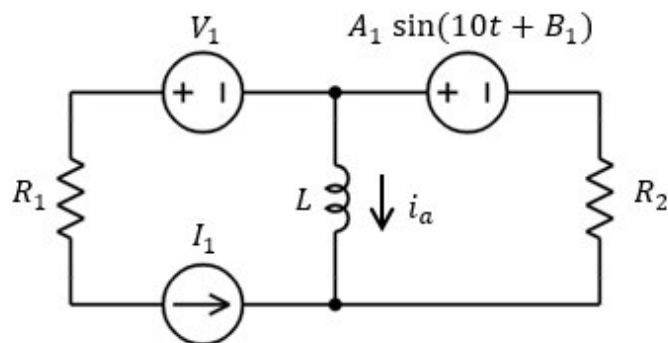
$$R_1 = 1 \Omega$$

$$R_2 = 1 \Omega$$

$$L = 100 \text{ mH}$$

$$A_1 = 3 \text{ V}$$

$$B_1 = -45 \text{ degrees}$$



(2) (5 points)

The AC circuit below is in steady state. The phasor diagram shows the phasor of i_s . It also shows the phasor \mathbf{V}_x , which is of one of the voltages v_1 , v_2 , or v_3 but you are not told which one. You are given that $\alpha = \frac{\pi}{3}$ and $|\mathbf{V}_x| = 8 \text{ V}$.

- Copy the phasor diagram with the given phasors and on that same diagram draw the phasors of v_1 , v_2 , and v_3 .
- What is the capacitor voltage v_2 at time $t = T/3$ where T is the period of the AC current source i_s ?
- What is the amplitude of the voltage v_1 across the current source if the frequency of i_s is multiplied by 2 (everything else in the systems stays the same)?
- Sketch the waveform v_1 from part (c). The phase does not need to be exact.

