EE 206: Homework #12

Superposition with Phasors. Due Monday, November 30th

Please make the subject "EE 206 HW#11" if submitting homework electronically to lauren.n.singelmann@ndsu.edu (or on blackboard)

Assume Vin is a 0V / 10V square wave at 500 rad/sec.

$$V_{in} = \begin{cases} 10V & \sin(500t) > 0 \\ 0V & otherwise \end{cases}$$

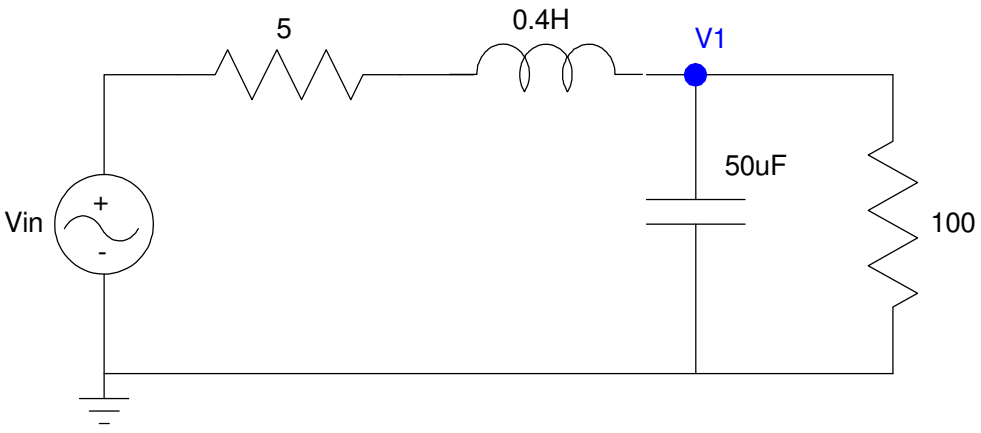
1) Determine the Fourier series approximation for Vin out to its 3rd harmonic

$$V_{in}(t) \approx a_0 + a_1\cos(500t) + b_1\sin(500t) + a_2\cos(1000t) + b_2\sin(1000t) + a_3\cos(1500t) + b_3\sin(1500t)$$

2) Determine V1(t) using phasor analysis and superposition (40 points)

note: this is actually four problems

- Find V1(t) at DC
- Find V1(t) at 500 rad/sec
- Find V1(t) at 1000 rad/sec
- Find V1(t) at 1500 rad/sec



Problem 1-2