

Name : _____ Section: _____ CWRU e-mail: _____

Department of Electrical Engineering and Computer Science
ENGR 210. Introduction to Circuits and Instruments (4)

Quiz No. 11

4/9/04

PUT ANSWERS IN THE SPACE PROVIDED AND, IF APPROPRIATE, SHOW YOUR WORK. BE SURE TO STATE ANY ASSUMPTIONS

Problem 1 Elementary phasors (10 points)

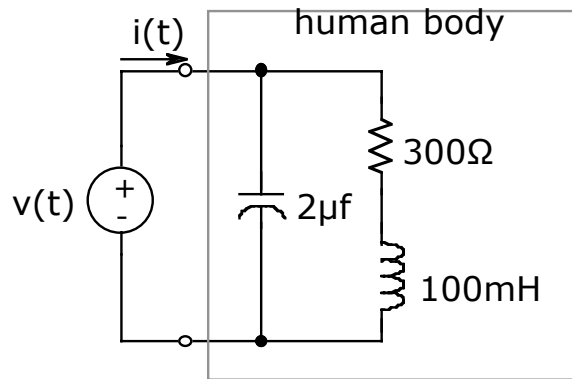
(a) Evaluate the complex number expression $\frac{61.7 \angle -27^\circ}{19 + j33}$. Your answer should be in rectangular form.

(b) Convert the sinusoid $v(t) = 36 \cos(754t + 80^\circ)$ to a phasor.

(c) Convert the phasor $(-1+j)$ to a real time-dependent function. Assume the frequency is ω in your answer.

Problem 2 Simple circuit analysis using phasors (10 points)

2. (10 points) There are 500 to 1000 deaths each year in the United States from electric shock. If a person makes a good contact with his/her hands, the resulting electrical circuit can be represented by the figure below where $v(t) = 160 \cos(\omega t)$ volts and $\omega = 377$.



- (a) Redraw the above circuit replacing all real quantities by their phasor equivalents. Use numerical values for all impedances.
- (b) What is the complex impedance of the human body as seen by the voltage source? Your answer should be a numerical value.
- (c) What is the steady-state current $i(t)$ flowing through the human body for the given $v(t)$?