EE 201 — HW 8-16 Name_____

This problem refers to Example 2 in the "AC-the hard way" lecture notes. Use the results given in the notes to find:

a. Use the results given in the notes to find the current in the circuit. (This will be a sinusoidal function of time.)

$i(t)$ = _____

b. Find the resistor voltage. (Also a function of time.)

$v_R(t)$ = _____

c. Find the inductor voltage. (Yep — function of time.)

$v_L(t)$ = _____

d. Show that the resistor, capacitor, and inductor voltages add to give the source voltage. (Might require some trigonometric gymnastics.) (Indicate clearly where this bit of work is in your solution below.)

e. Make the following changes: $R = 680\ \Omega$, $C = 0.15\ \mu$F, $\omega = 25{,}000$ rad/s, and $V_m = 2$ V. Calculate the new values of A, B, M, and θ for the capacitor voltage.

A = _____ B = _____

M = _____ θ = _____

f. Calculate the same quantities as in part (e), but change the angular frequency to $\omega = 10^5$ rad/s. All other values are the same as part (e).

A = _____ B = _____

M = _____ θ = _____

Write your answers — and whatever work will fit — on this sheet. Staple any sheets with additional work behind.