ECE 1050/60  homework # 13  1050 Due: Wed,3/10/04  1060 Due: Wed, 3/3/04
May be handed in for full credit at the time of the 2nd exam on W
Warning: This homework is more than normal -- DO NOT put it off until the last minute.
Read chapter 4 in your textbook & do the following problems. They start on page 206, answers start on page 213.

4.9
4.12
4.23 hint on part c: invert Z_{eq}
Instead of solving this: \[ 20 \degree - \frac{32}{32} \angle \deg = \frac{1}{l + j \omega C} \]
solve this: \[ 0.05/32 \deg = \frac{1}{R + j \omega C} \]
4.25 b,c,d
4.35 a
4.39 a,b,c
4.51 a,b

Problems 6.32, 6.33, 6.41, 6.35, 6.36, 6.37 below

6.32. Find Z_{eq} and Y_{eq} for the two branch parallel circuit shown in Fig. 6-46 below. Compute the current from each equivalent circuit.  
\[ \text{Ans. } Z_{eq} = 18.6/7.15^\circ, \quad Y_{eq} = -0538/-7.15^\circ, \quad I_r = 10.75/-7.15^\circ \]

6.33. In the parallel circuit shown in Fig. 6-47 above, find the two branch currents and the total current. Construct the current phasor diagram showing I_1, I_2 and I_r.  
\[ \text{Ans. } I_1 = 5^\circ, I_2 = 20^\circ, I_r = 15^\circ \]

6.41. In Fig. 6-55 above, given V = 100/90° and I_r = 50.2/102.5°, determine Z.  
\[ \text{Ans. } Z = 5/45^\circ \]

6.35. A two branch parallel circuit has a corresponding phasor diagram as shown in Fig. 6-49 below. Find the branch impedances Z_1 and Z_2.  
\[ \text{Ans. } Z_1 = 2.5 + j20, \quad Z_2 = 15/-90^\circ \]

6.36. A two branch parallel circuit has an applied voltage and resulting currents as given in the phasor diagram shown in Fig. 6-50 below. Find the branch impedances Z_1 and Z_2.  
\[ \text{Ans. } Z_1 = 11.55 - j20, \quad Z_2 = 27.6 + j11.75 \]

6.37. In Fig. 6-51 above, given I_1 = 2/-30° and I_r = 4.47/33.4°, find Z_2.  
\[ \text{Ans. } Z_2 = -j5 \]

Answers
Answers to odd problems are in the textbook, starting on page 213.

4.12  a) 5.2V /-90deg  Or:  (0 - 5.2-j) · V  b) 10.8-μA · cos(2513·t + 56.3·deg)