ECE 2202 – CIRCUIT ANALYSIS II

HOMEWORK #8

1. Find the rms value of the periodic voltage *v(t)*.



2. Three loads in the figure below are connected in parallel across a 110[Vrms], 60[Hz] sinusoidal voltage source as shown in the figure. The circuit is in the steady-state.

Load 1 absorbs 250[W] and 500[VAR].

Load 2 absorbs (1850–40[VA].

Load 3 has an impedance of 3-10j[].

Find the expression for *iX(t)*. Assume that *vS(t)* is a cosine function with a phase of zero.



3. The circuit given below operates in steady-state.

1. Draw the circuit given in the phasor domain.
2. Find the values of *LX* that will make the load have a unity power factor, that is, a power factor equal to 1.





4. The circuit given below operates in steady-state. It is known that Load 1 absorbs 30[kW] and absorbs 25[kVAR]. Load 2 absorbs 2215[kVA]. Load 3 absorbs an apparent power of 45[kVA], at a lagging power factor of 0.73.



1. Find *iX(t)*.
2. Find *vL3(t)*.



## Numerical Solutions

1 1.53[V]

2 34.58 cos(377[rad/s]t + 41.97°)[A]

3 a) solution omitted here b) 378[H] or 22.7[mH]

4. a) 3915cos (300[rad/s]t + 85.2°)[A]; b) 23.0 cos(300[rad/s]t – 51.7°)[V]