

1. (30%) Use node analysis to find the value of v_o in the circuit in Fig. 1.

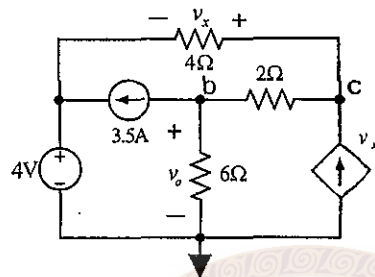


Fig. 1

2. (30%) There is no energy stored in the circuit seen in Fig. 2 at the time the two sources are energized. Use the principle of superposition to find v_o for $t > 0$.

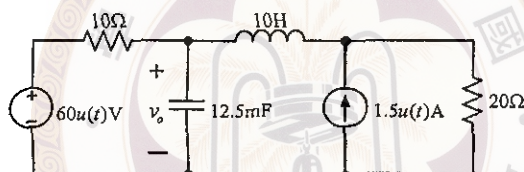


Fig. 2

3. (20%) Find the ac steady-state for v_o in the circuit of Fig.3 if $i_g = 0.5\cos 2000t$ A.

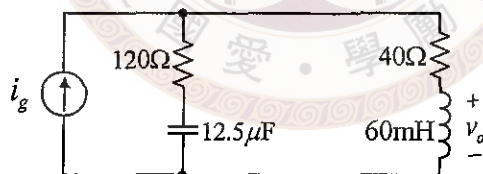


Fig. 3

4. (20%) An industrial dryer operates at 600 V and requires 50 A. The unit consists of a fan in parallel with a heater. The fan draws 20kW and has a lagging power factor of 0.8. Use a power triangle to find the resistance of the heater, assuming that it has unity power factor.