

ENGR 065 - HW #5 - 1

Problem 1:

applying nodal analysis at I

$$\frac{V_o - V}{2} + \frac{V_o}{4} + \frac{V_o + 50}{8} = 12.5 \Rightarrow 4V_o - 4V + 2V_o + V_o + 50 = 100$$

$$7V_o - 4V + 50 = 100 \Rightarrow 7V_o - 4V = 50$$

nodal analysis at II

$$\frac{V - 100}{1} + \frac{V - V_o}{2} + 12.5 = 0 \Rightarrow 3V - 200 - V_o + 25 = 0$$

$$\frac{3V - V_o}{3} = \frac{175}{-V_o}$$

$$V_o = 50 \text{ V}$$

$$3(-\frac{175}{-V_o})$$

Problem 2:

$$\frac{V - 80V_o}{10} + \frac{V - 4V_o}{20} + i_o = 0 \Rightarrow 2V - 160 + V - 4V_o + 20i_o = 0$$

$$3V - 4V_o + 20i_o = 160$$

$$V_o = \frac{V + 96 - V_o}{40}$$

$$i_o + 2i_o = \frac{V_o}{80}$$

$$3i_o = \frac{V_o}{80} \Rightarrow 240i_o = V_o$$

$$3V - 960i_o + 20i_o = 160 \Rightarrow 3V - 940i_o = 160$$

$$40V_o = V + 96 - 240i_o \Rightarrow 280i_o - V = 96$$

$$V_o = -4.48 \text{ A}$$

$$V_o = 240i_o = -240 \cdot -4.48$$

$$V_o = -1075.2$$