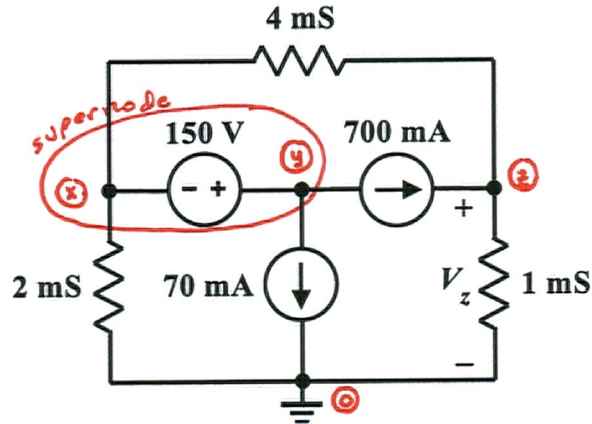


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EE 2240

Homework Problem #09

Develop node equations and express them in the standard matrix form. Then, using a method of your choosing, solve for V_z .



$$V_y - V_x = 150V \quad (\text{constraint equation for the 150V source})$$

$$0.004(V_z - V_x) - 0.7 + 0.001V_z = 0 \quad (\text{KCL for node z})$$

$$0.004(V_x - V_z) + 0.7 + 0.07 + 0.002V_x = 0 \quad (\text{KCL for the supernode})$$

In matrix form:

$$\begin{bmatrix} -1 & 1 & 0 \\ -0.004 & 0 & 0.005 \\ 0.006 & 0 & -0.004 \end{bmatrix} \begin{bmatrix} V_x \\ V_y \\ V_z \end{bmatrix} = \begin{bmatrix} 150 \\ 0.7 \\ -0.77 \end{bmatrix}$$

Solving yields:

$$V_x = -75V, \quad V_y = 75V, \quad V_z = 80V$$