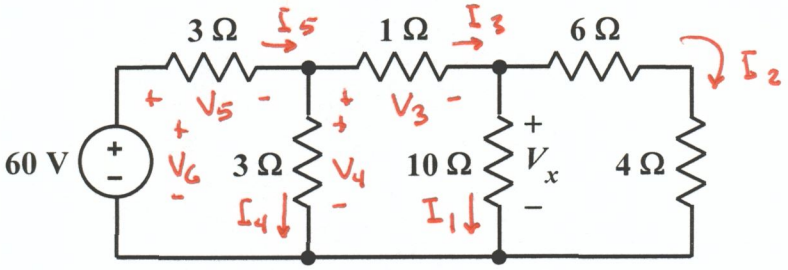
EE 2240

Problem #03

Use linearity and proportionality to determine V_x. Show all details of your work.



Assume $V_x = 10V$ (Any guess is ok.)

Then $I_1 = \frac{V_x}{10\Omega} = 1A$

$I_2 = \frac{V_x}{6\Omega + 4\Omega} = 1A$

$I_3 = I_1 + I_2 = 2A$

$V_3 = (1\Omega)\, I_3 = 2V$

$V_4 = V_3 + V_x = 12V$

$I_4 = \frac{V_4}{3\Omega} = 4A$

$I_5 = I_3 + I_4 = 6A$

$V_5 = (3\Omega)\, I_5 = 18V$

$V_6 = V_5 + V_4 = 30V$

$\frac{V_x}{60V} = \frac{10V}{V_6} \Rightarrow V_x = 20V$