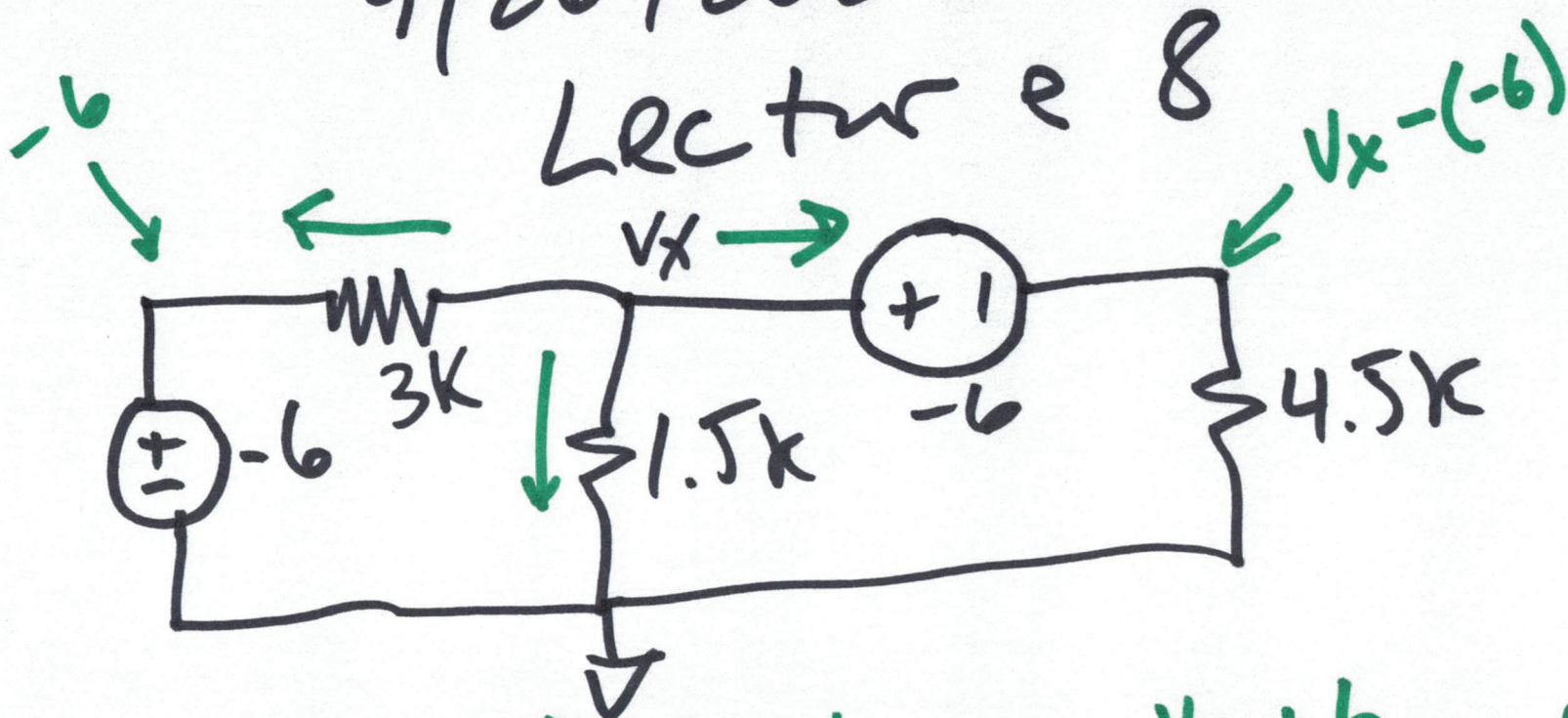


EE 220 CIRCUITS I

9/26/2022

Lecture 8

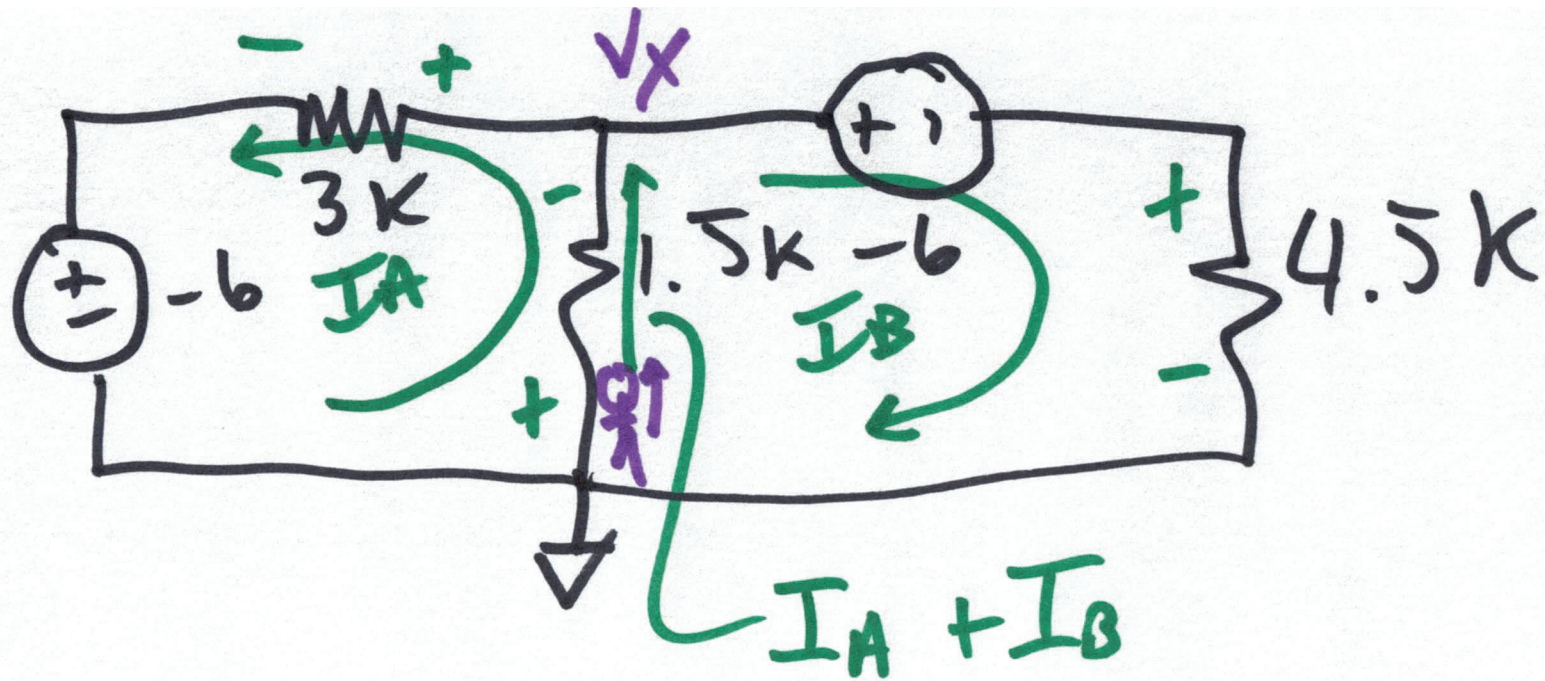


$$\frac{V_x - (-6)}{3k} + \frac{V_x}{1.5k} + \frac{V_x + 6}{4.5k} = 0$$

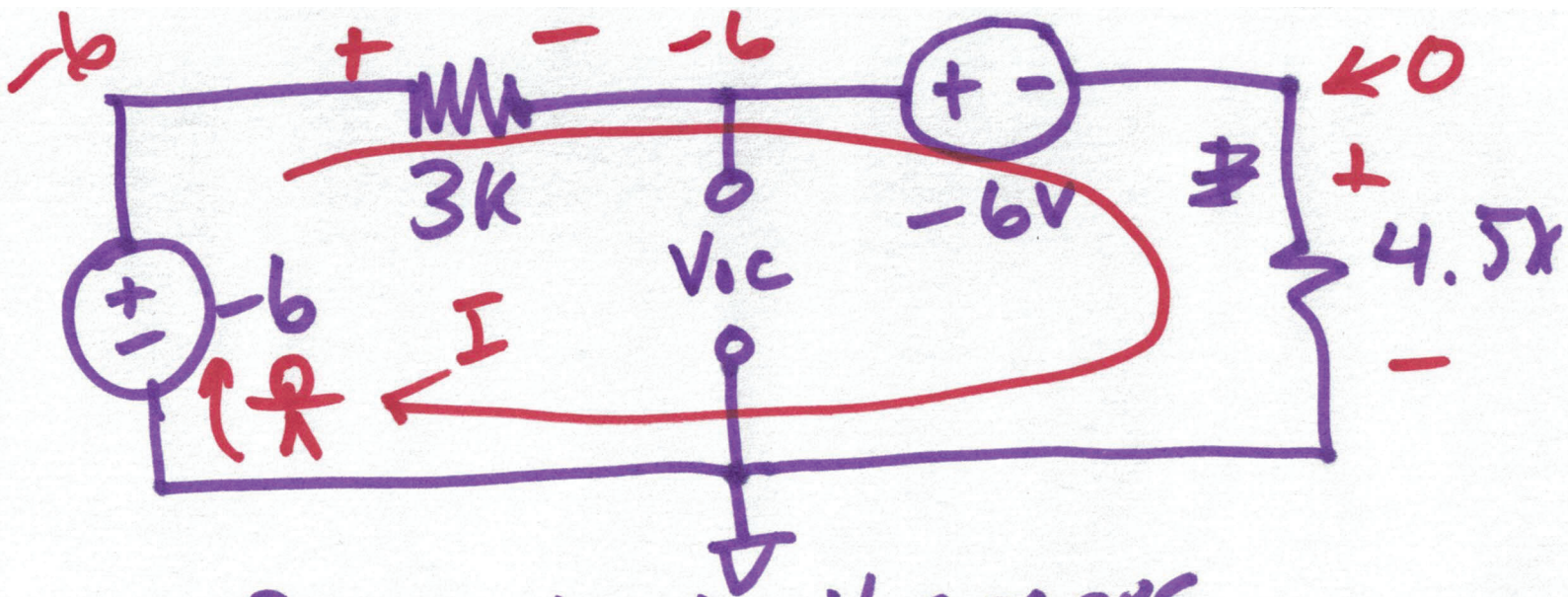
$$1.5kx + 9 + 3V_x \quad V_x + 6 = 0$$

$$5.5V_x = -15$$

$$V_x = -2.73$$



$$\begin{aligned}
 -1.5k(I_A + I_B) - (-6) - 4.5kI_B &= 0 \\
 +(-6) + 3kI_A + 1.5k(I_A + I_B) &= 0 \\
 V_x &= -1.5k(I_A + I_B)
 \end{aligned}$$

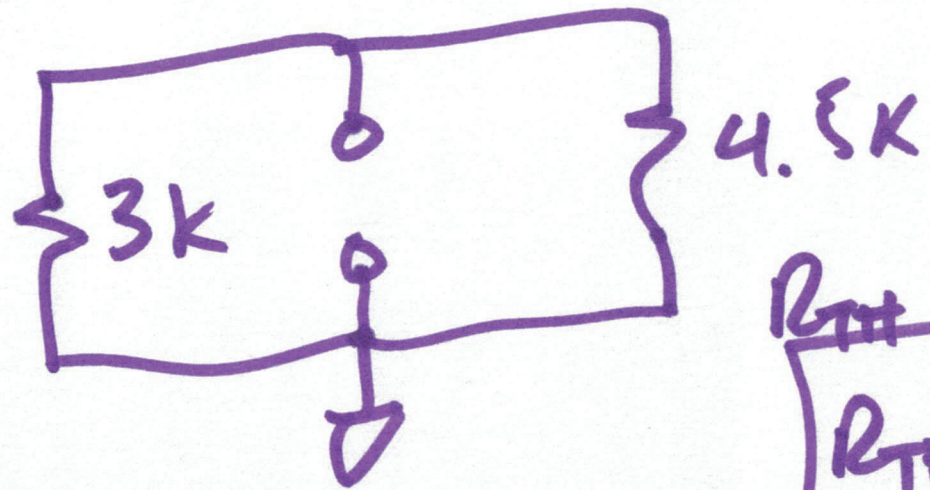


$R_{TH} \rightarrow$ short V sources
 current sources OPEN

$$+(-6) - 3kI - (-6) = 0$$

$$4.5k I = 0$$

$$I = 0$$

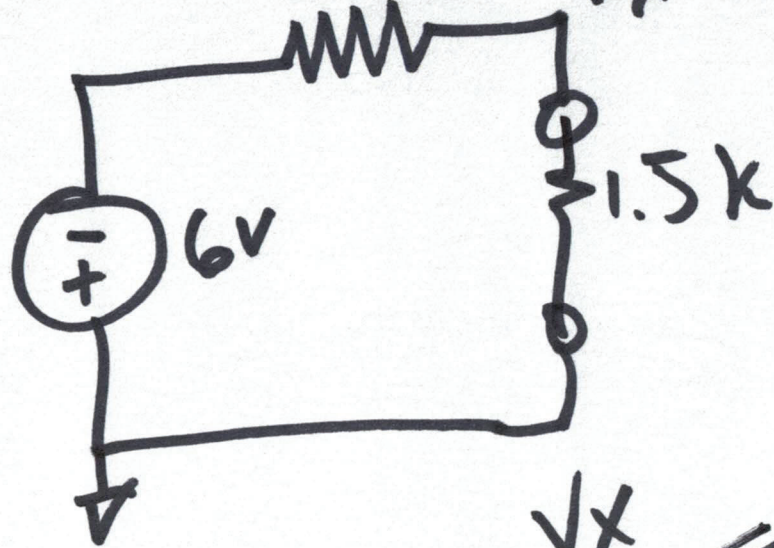


$$R_{TH} = 3k \parallel 4.5k$$

$$R_{TH} = 1.8k$$

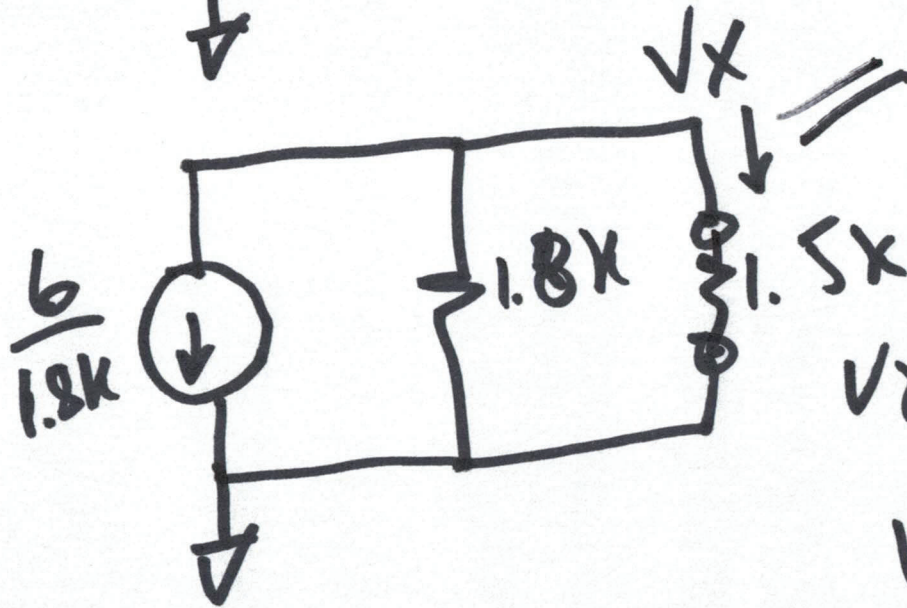
5)

Thevenin E_{θ}



$$V_x = -6 \cdot \frac{1.5}{1.5 + 1.8}$$

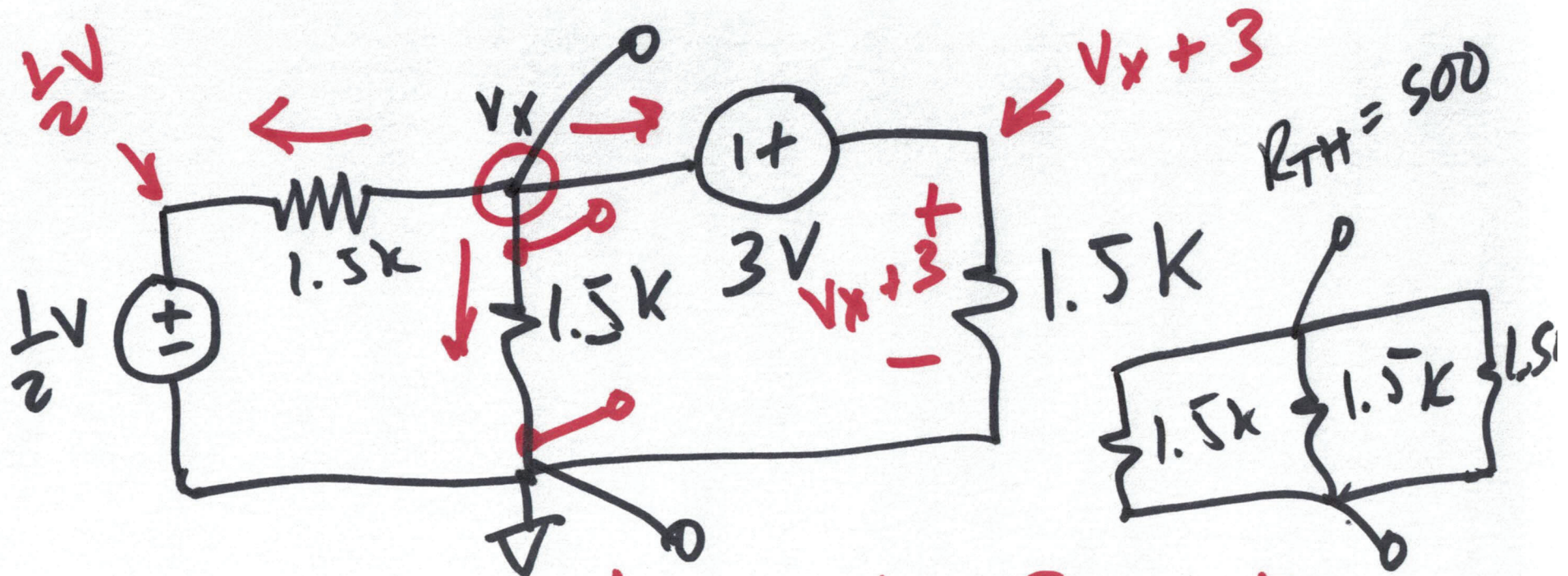
$$= -2.73V$$



$$V_x = \frac{6}{1.8k} \cdot \frac{1.8k}{1.5k + 1.8k}$$

$$V_x = \frac{6}{3.3k} \cdot 1.5k$$

$$V_x = -2.73V$$



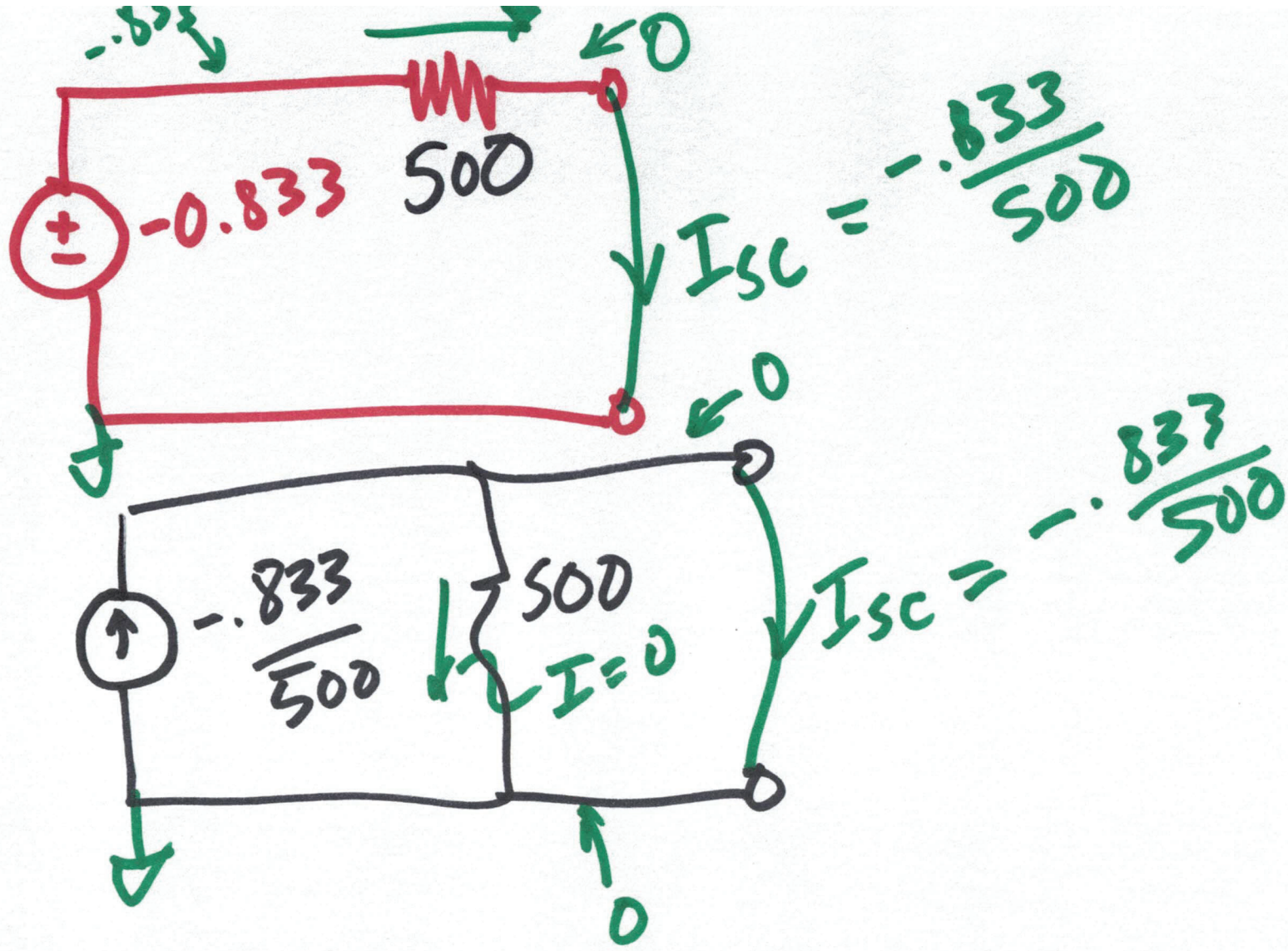
$$\frac{V_x}{1.5K} + \frac{V_x - \frac{1}{2}}{1.5K} + \frac{V_x + 3}{1.5K} = 0$$

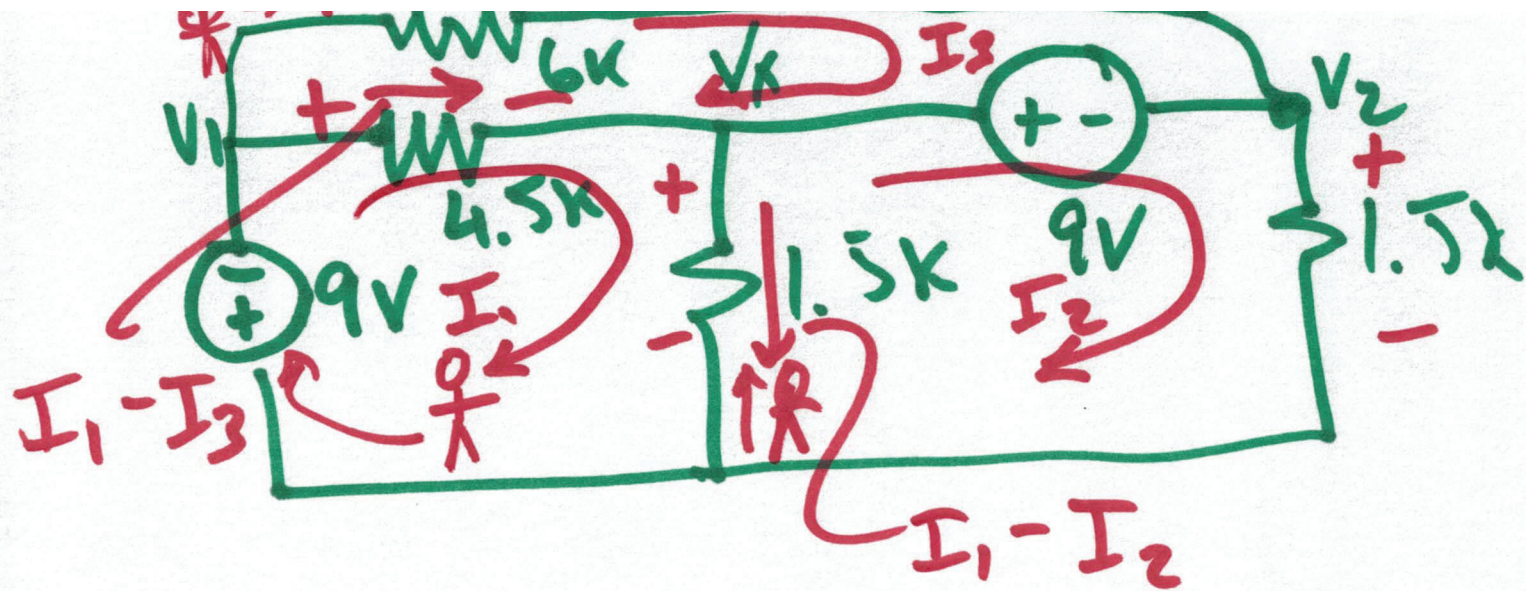
$$V_x + V_x - \frac{1}{2} + V_x + 3 = 0$$

$$3V_x = -2.5$$

$$V_x = -\frac{2.5}{3} =$$

$$-0.833 = V_x$$

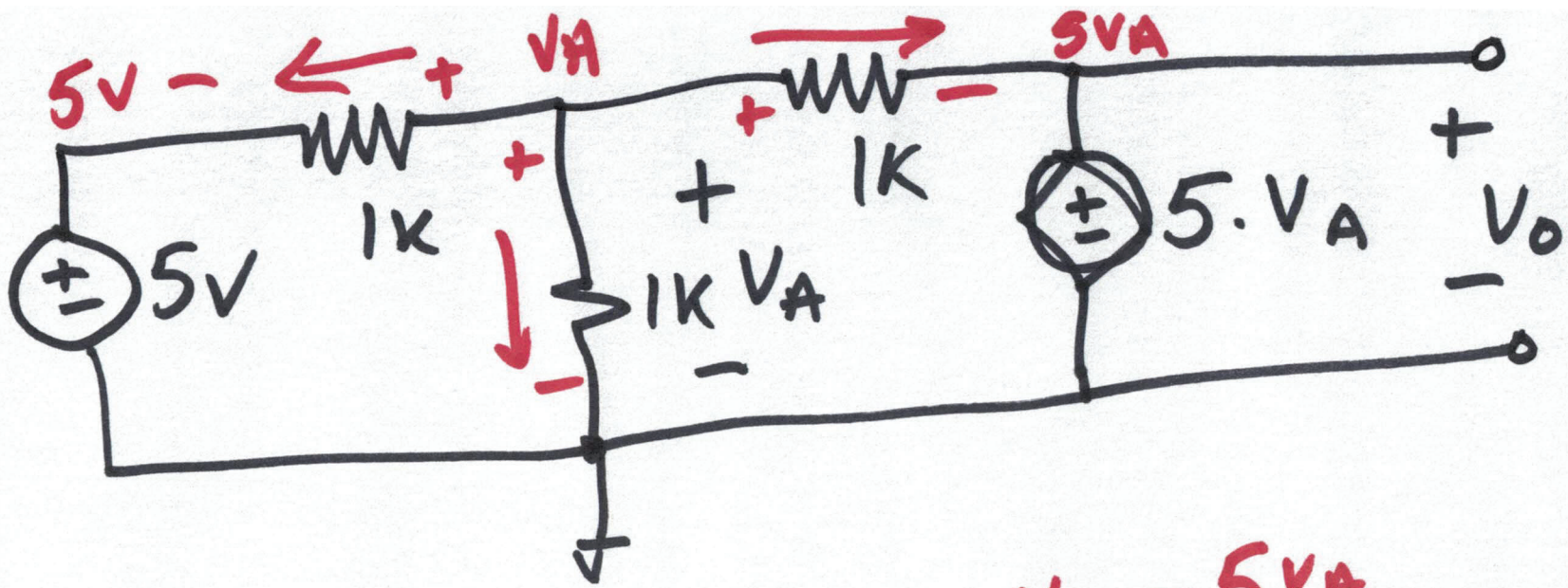




$$-6kI_3 + 9 + 4.5k(I_1 - I_3) = 0$$

$$+1.5k(I_1 - I_2) - 9 - 1.5kI_2 = 0$$

$$-9 - 4.5k(I_1 - I_3) - 1.5k(I_1 - I_2) = 0$$



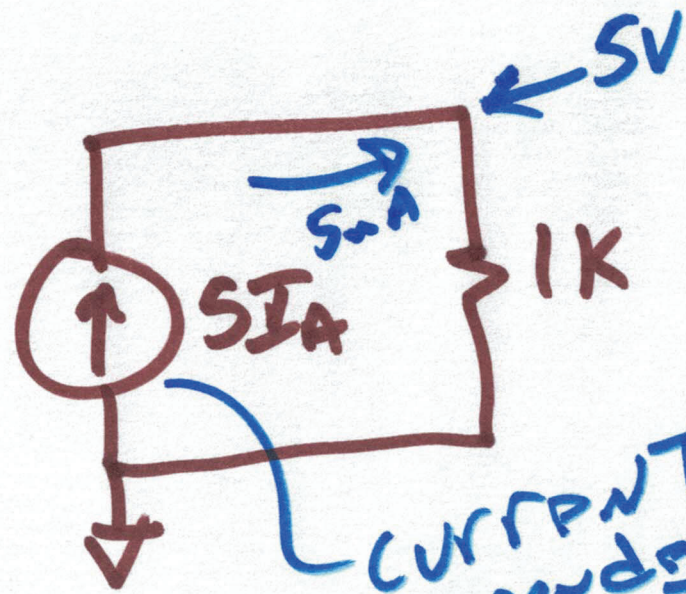
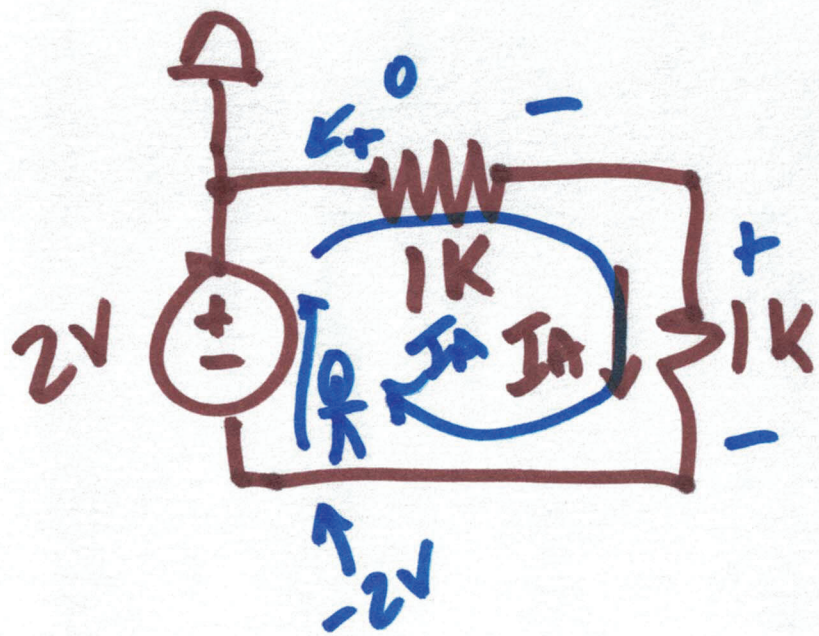
$$\frac{V_A - 5}{1k} + \frac{V_A}{1k} + \frac{V_A - 5V_A}{1k} = 0$$

$$V_A - 5 + V_A + V_A - 5V_A = 0$$

$$-5 = 2V_A$$

$$V_A = -2.5V$$

8)



CURRENT
DEPENDENT
CURRENT
SOURCE

$$+2V - 1kIA - 1kIA = 0$$

$$2V = 2kIA$$

$$I_A = \frac{2}{2k} = 1 \text{ mA}$$