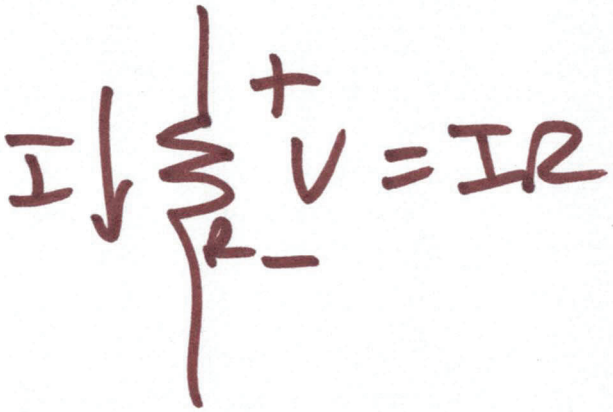
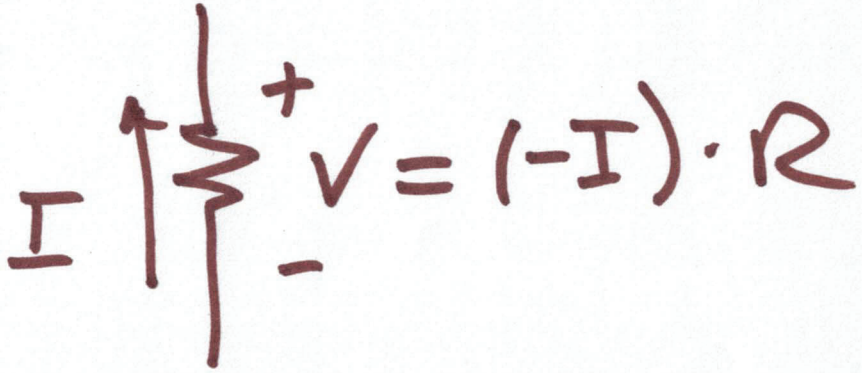
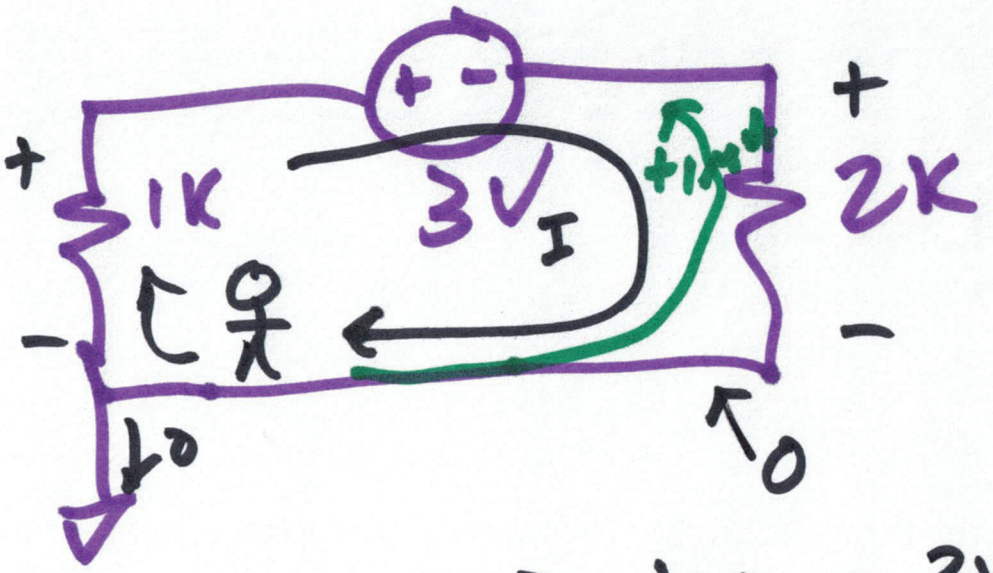
EE 221 Circuits II

Lecture 1

January 18, 2023







$I = -1mA$

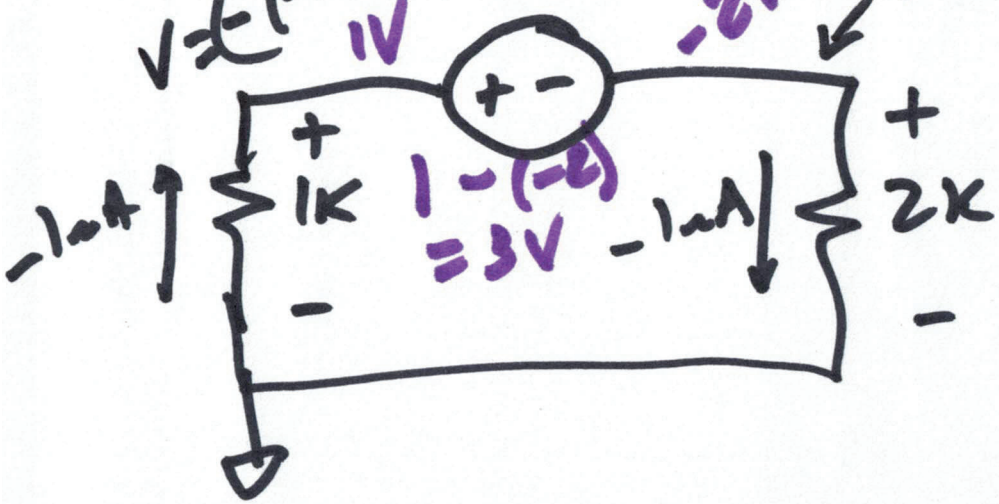
$1V - (-I)\cdot 1K - 3V - I\cdot 2K = 0$

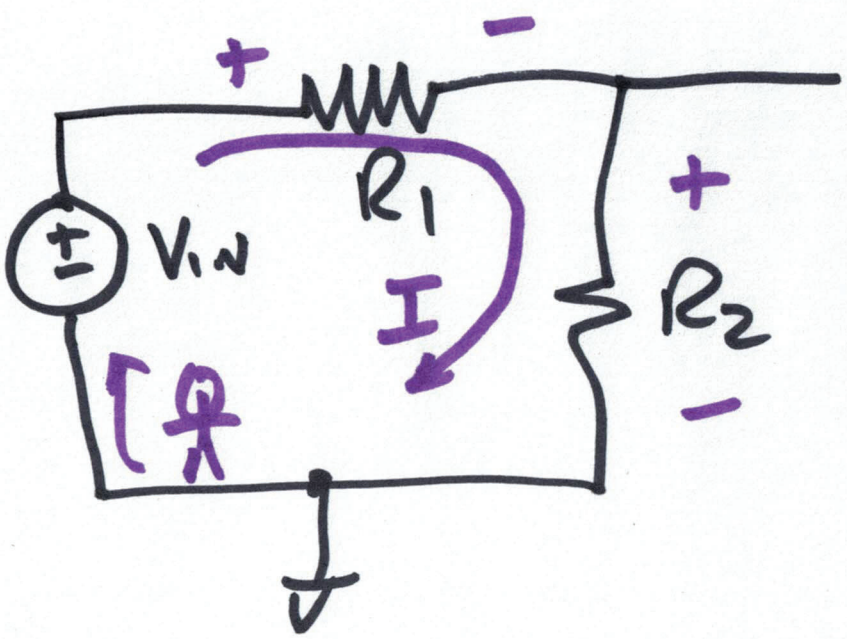
$V = (-1mA)\cdot 2K = -2V$

$1V - 3V = -3KI$

$-3KI = 3$

$I = -1mA = \frac{-3V}{3K}$

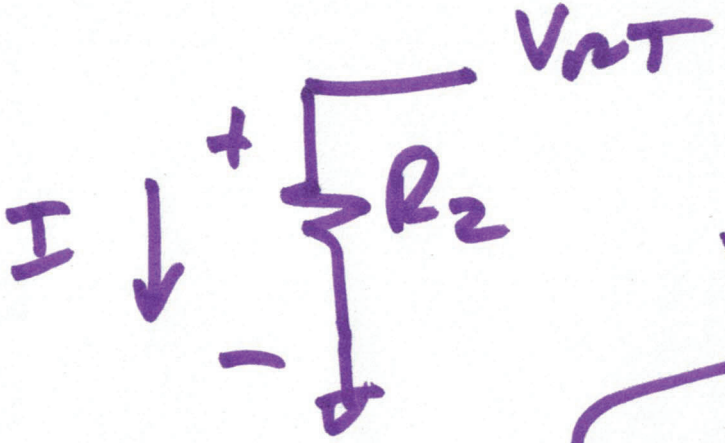




$$V_{OUT} = V_{IN} \cdot \frac{R_2}{R_1 + R_2}$$

$$+V_{IN} - IR_1 - I \cdot R_2 = 0$$

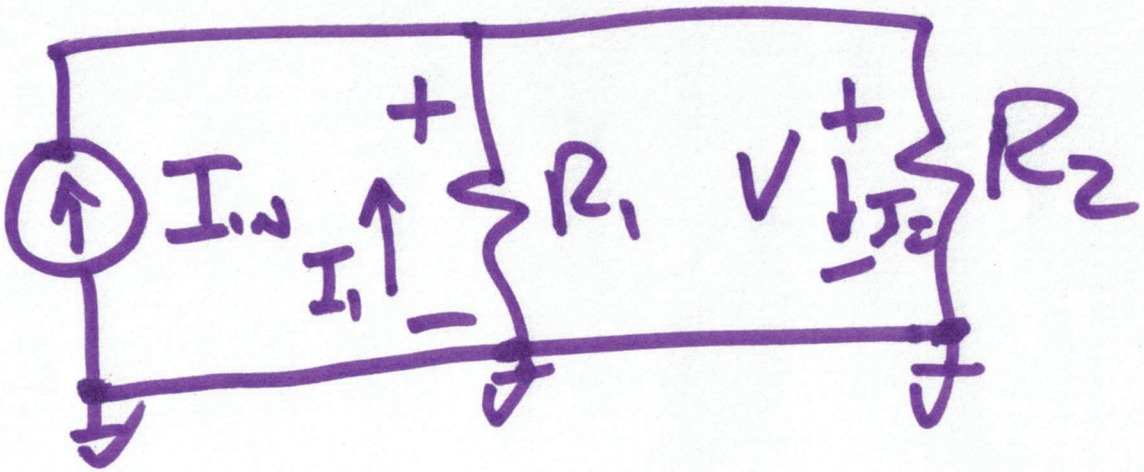
$$I = \frac{V_{IN}}{R_1 + R_2}$$



$$V_{OUT} = 3 \cdot \frac{2K}{2K + 1K}$$

$$V_{OUT} = I \cdot R_2 \qquad = 2V$$

$$\boxed{V_{OUT} = V_{IN} \cdot \frac{R_2}{R_1 + R_2}}$$



$$V = I_2 R_2$$

$$I_{IN} + I_1 = I_2$$

$$I_{IN} - \frac{V}{R_1} = \frac{V}{R_2}$$

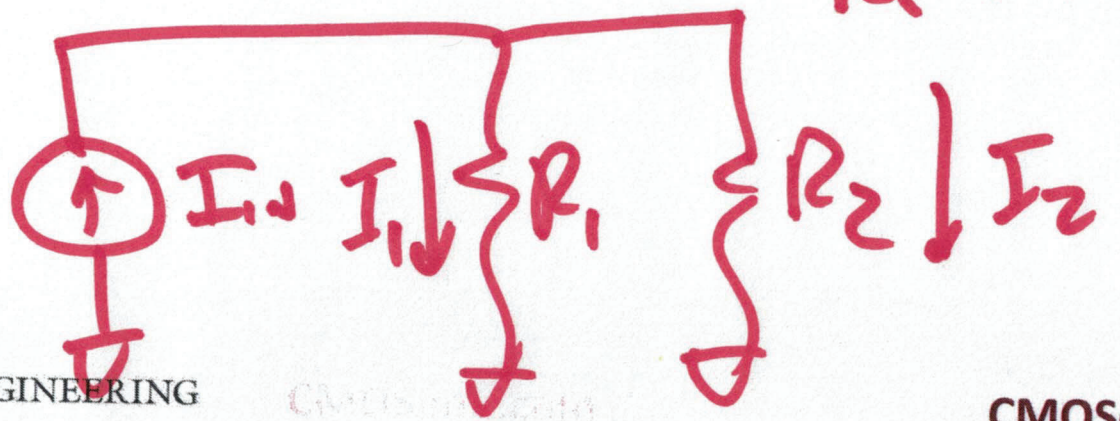
$$I_{IN} = V\left(\frac{1}{R_1} + \frac{1}{R_2}\right)$$

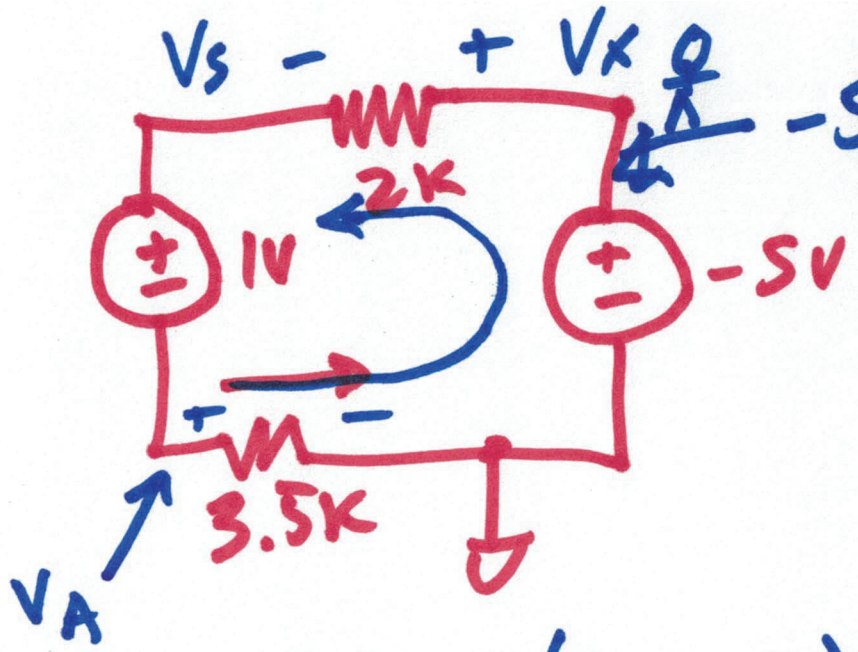
$$I_{IN} = I_2 \cdot R_2\left(\frac{1}{R_1} + \frac{1}{R_2}\right)$$

$$I_2 = I_{IN} \cdot \frac{1}{R_2\left(\frac{1}{R_1} + \frac{1}{R_2}\right)}$$

$$= I_{IN} \cdot \frac{1}{\frac{R_2}{R_1} + 1} \cdot \frac{R_1}{R_1}$$

$$I_2 = I_{IN} \cdot \frac{R_1}{R_1 + R_2}$$





$$-(-5) + 3.5kI + 1 + 2k \cdot I = 0$$

$$6 + 5.5kI = 0$$

$$3.5k \cdot \frac{-6}{5.5k} = VA = \frac{-7}{11} \cdot 6 \quad I = \frac{-6}{5.5k}$$

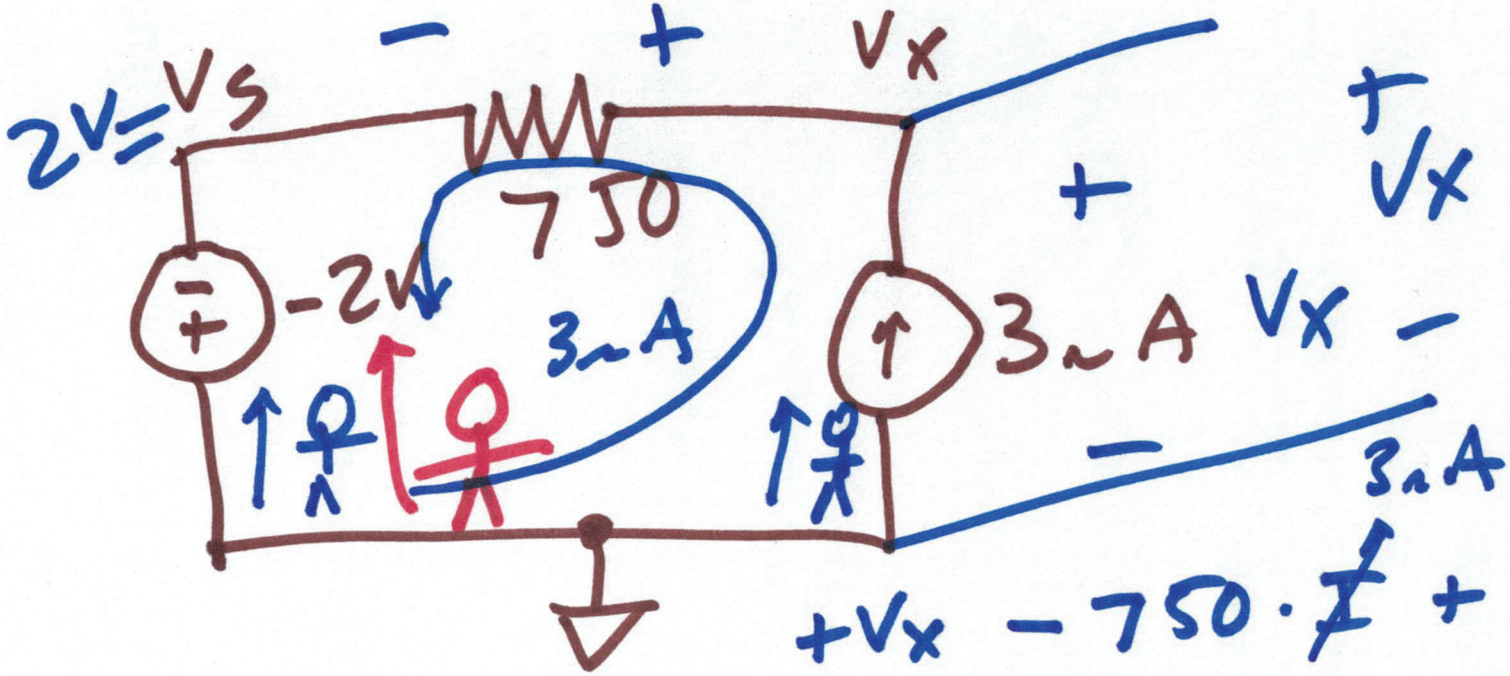
$$= -\frac{42}{11} = \quad = -1\frac{1}{11} \sim A$$

$$-3\frac{9}{11} V$$

$$V_S = -3\frac{9}{11} + 1$$

$$= -2\frac{9}{11} V$$

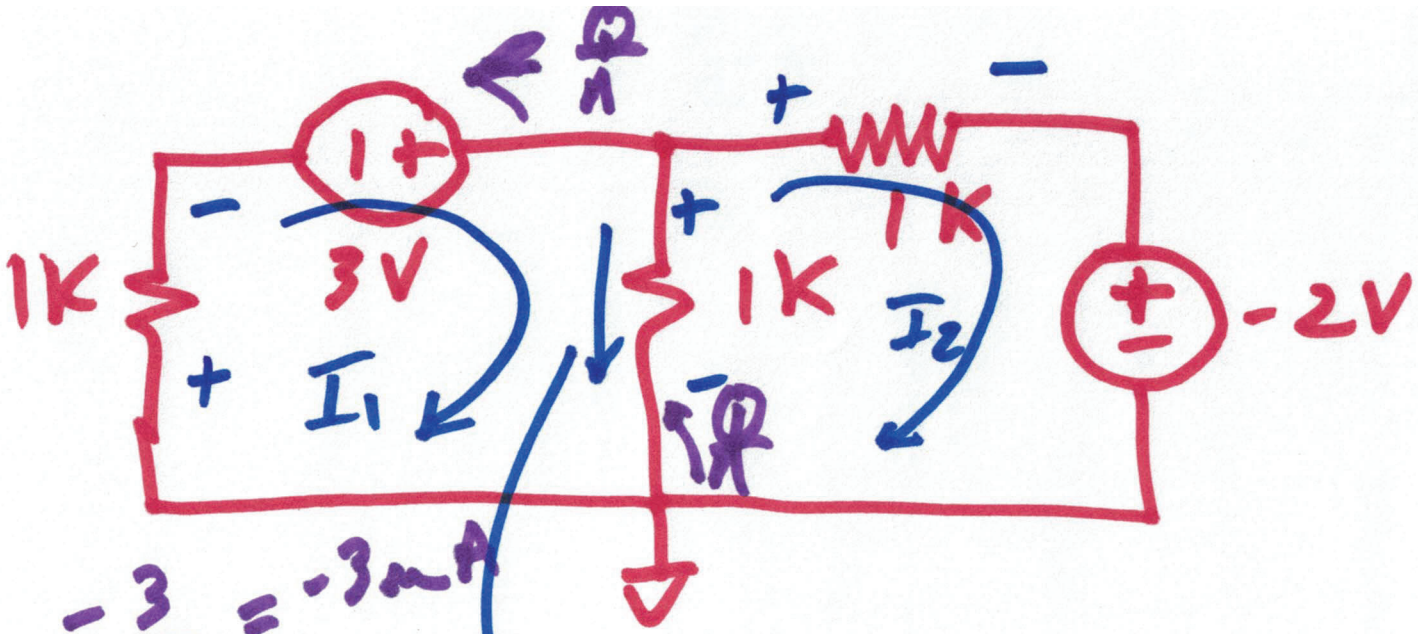
$$= -2.818 V$$



$+V_x - 750 \cdot \not{I} + (-2) = 0$

$-(-2) =$ **$V_S = 2V$**

$-(-2) + 750 \cdot 3mA = V_x$



$$-\frac{3}{1K} = -3mA$$

$$I_1 - I_2$$

$$-3 + 1K\,I_1 + 1K(I_1 - I_2) = 0$$

$$+1K(I_1 - I_2) - I_2 \cdot 1K - (-2) = 0$$

$$-3mA + 2I_1 - I_2 = 0$$

$$I_2 = 2I_1 - 3mA$$

$$I_1 - 2I_2 + 2\,mA = 0$$

$$I_1 - 2(2I_1 - 3\,mA) + 2\,mA = 0$$

$$I_1 - 4I_1 + 6\,mA + 2\,mA = 0$$

$$-3I_1 = -8\,mA$$

$$I_1 = \frac{8}{3}\,mA = 2\frac{2}{3}\,mA$$

$$I_2 = 2\left(\frac{8}{3}\,mA\right) - 3\,mA$$

$$= \frac{16}{3}\,mA - 3\,mA$$

$$\frac{7}{3}\,mA = \frac{16}{3} - \frac{9}{3}$$

I_2 $2\frac{1}{3}\,mA$