

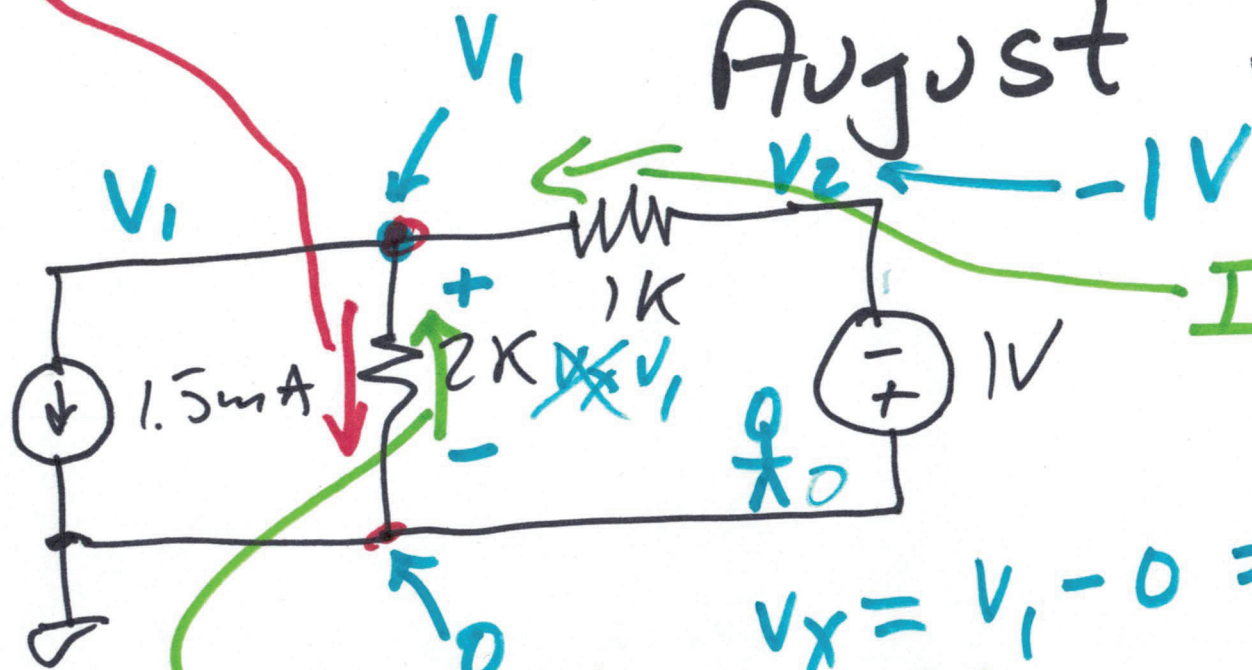
EE 220 circuits I

Lecture 3

August 31, 2020



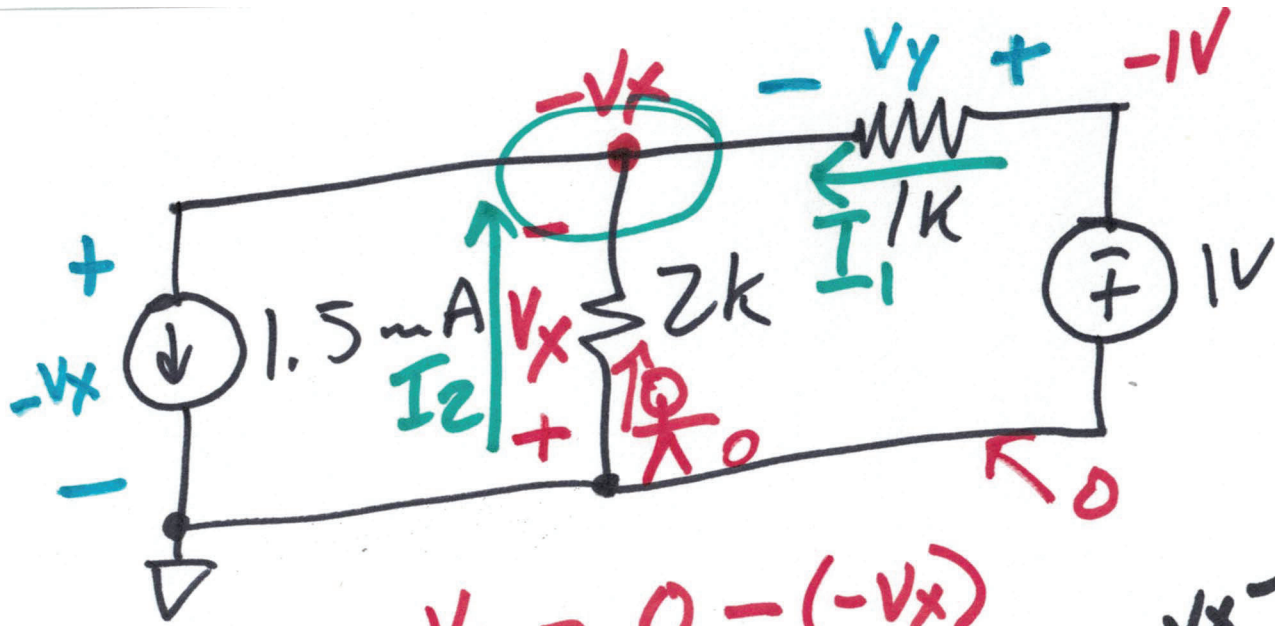
$$I = \frac{V_1 - 0}{2K}$$



$$I = \frac{V_2 - V_1}{1K}$$

$$I = \frac{0 - V_1}{2K} = -\frac{V_1}{2K}$$

$V_x = V_1 - 0 = V_1$



$$V_y = -1 - (-V_x) = V_x - 1$$

$$V_x = 0 - (-V_x)$$

$$I_1 = \frac{-1 - (-V_x)}{1k} = \frac{V_x - 1}{1k}$$

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$$I_2 = \frac{0 - (-V_x)}{2k} = \frac{V_x}{2k}$$

$$I_1 + I_2 = 1.5 \mu A$$

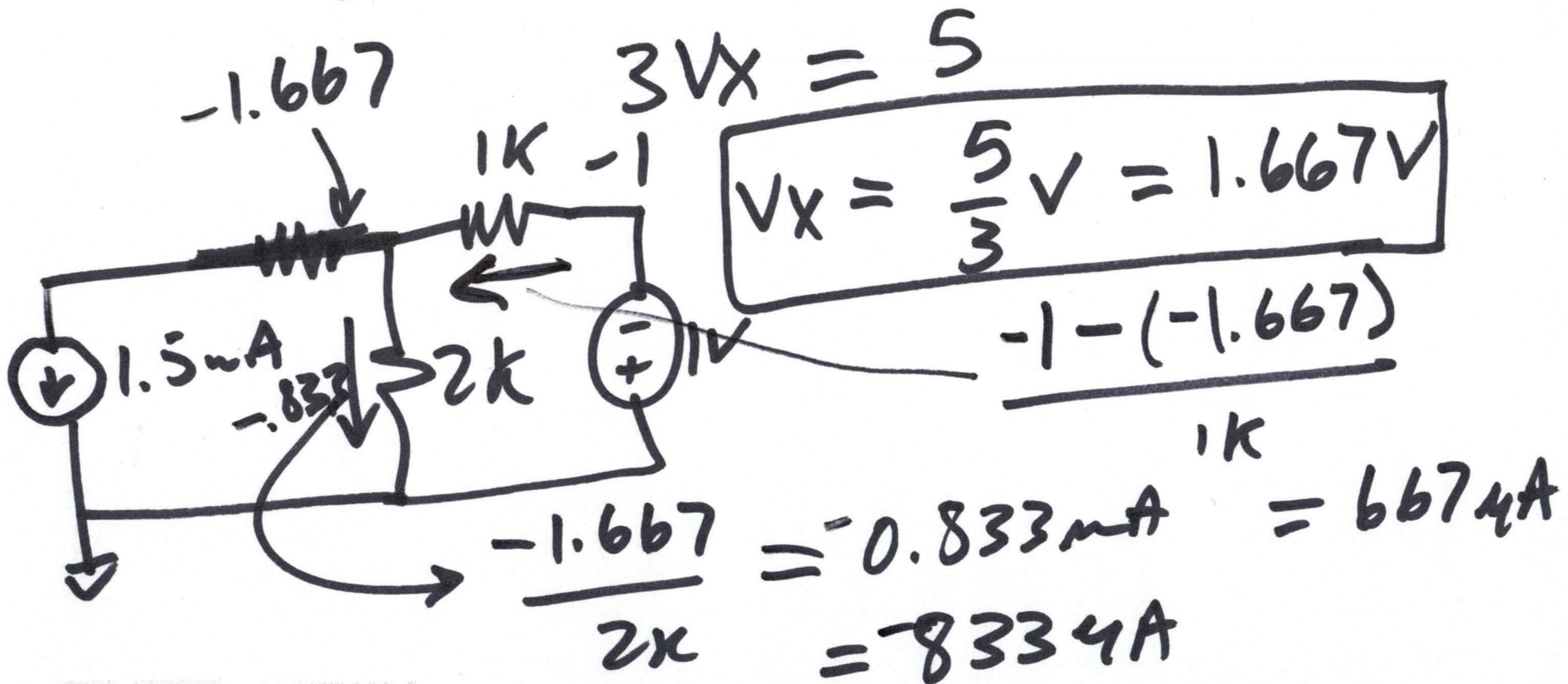
2)

$$\frac{V_x - 1}{1k\Omega} + \frac{V_x}{2k\Omega} = 1.5\mu A$$

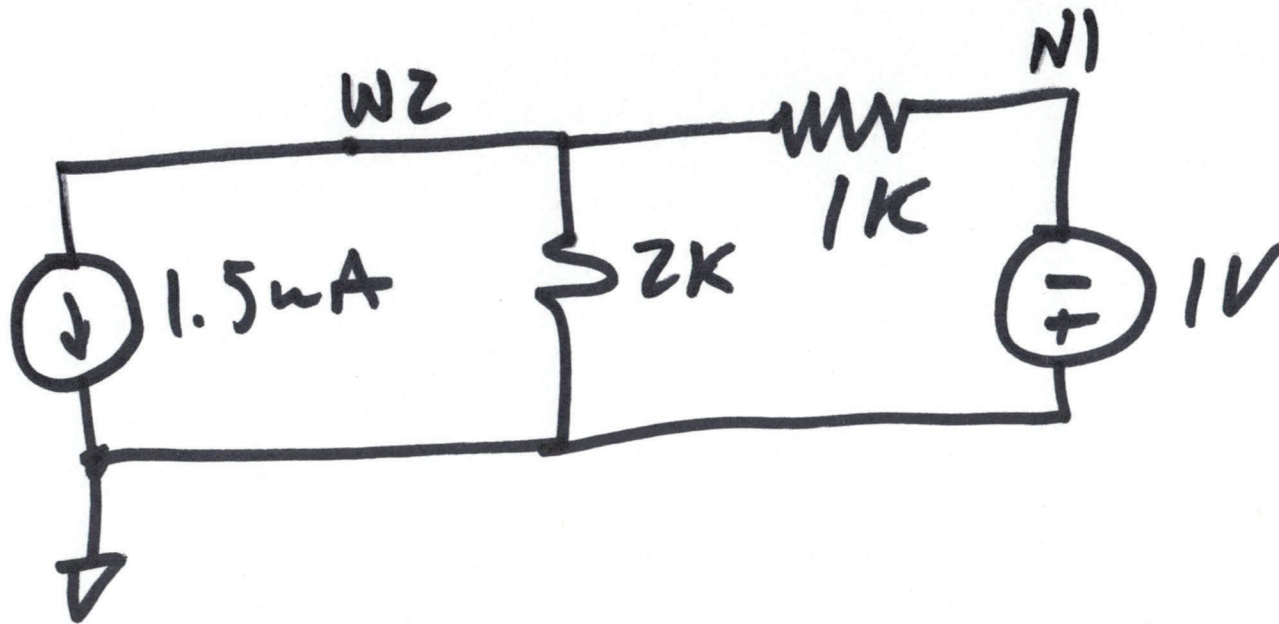
$$2V_x - 2 + V_x = 3V$$

$$3V_x = 5$$

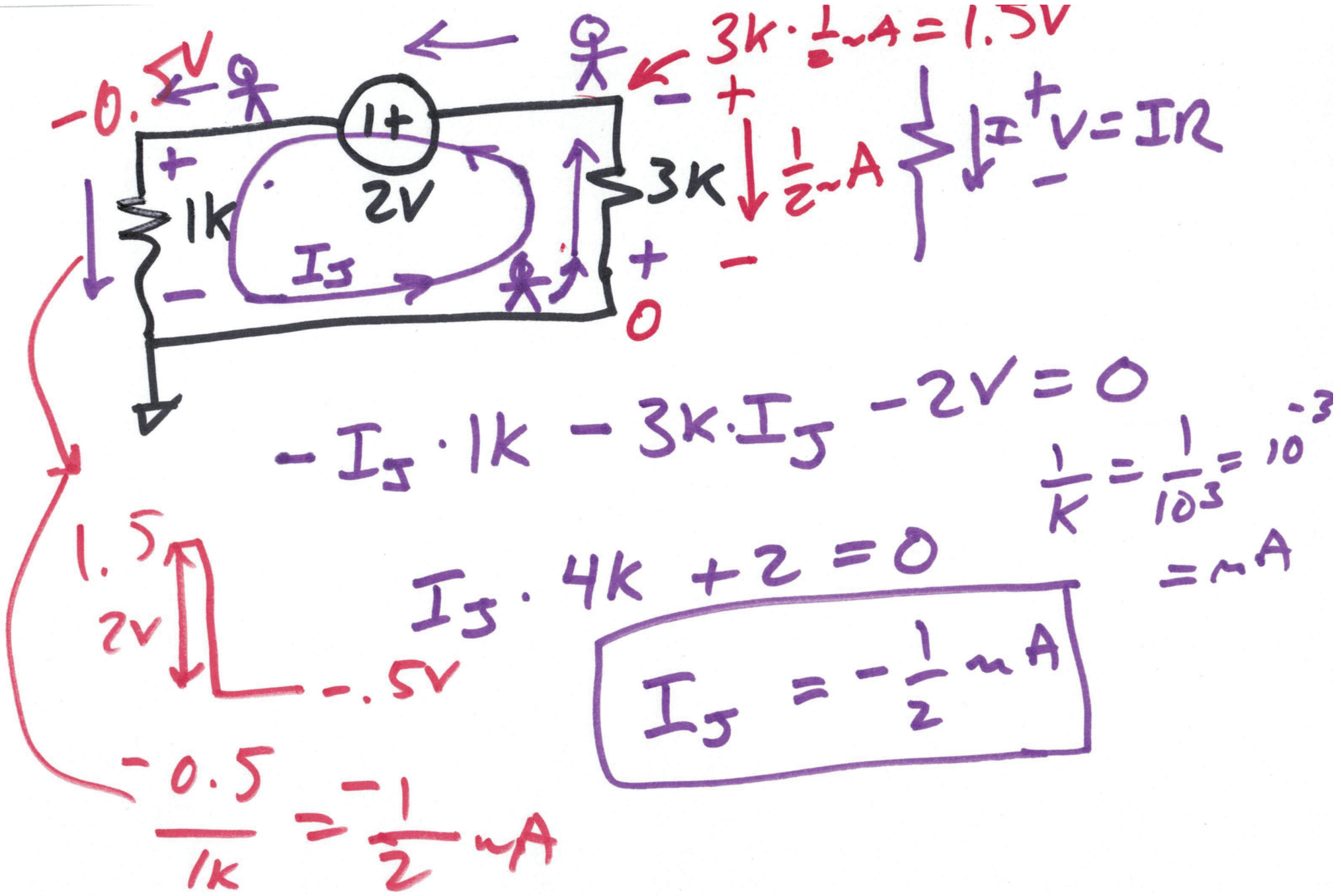
$$V_x = \frac{5}{3} V = 1.667V$$

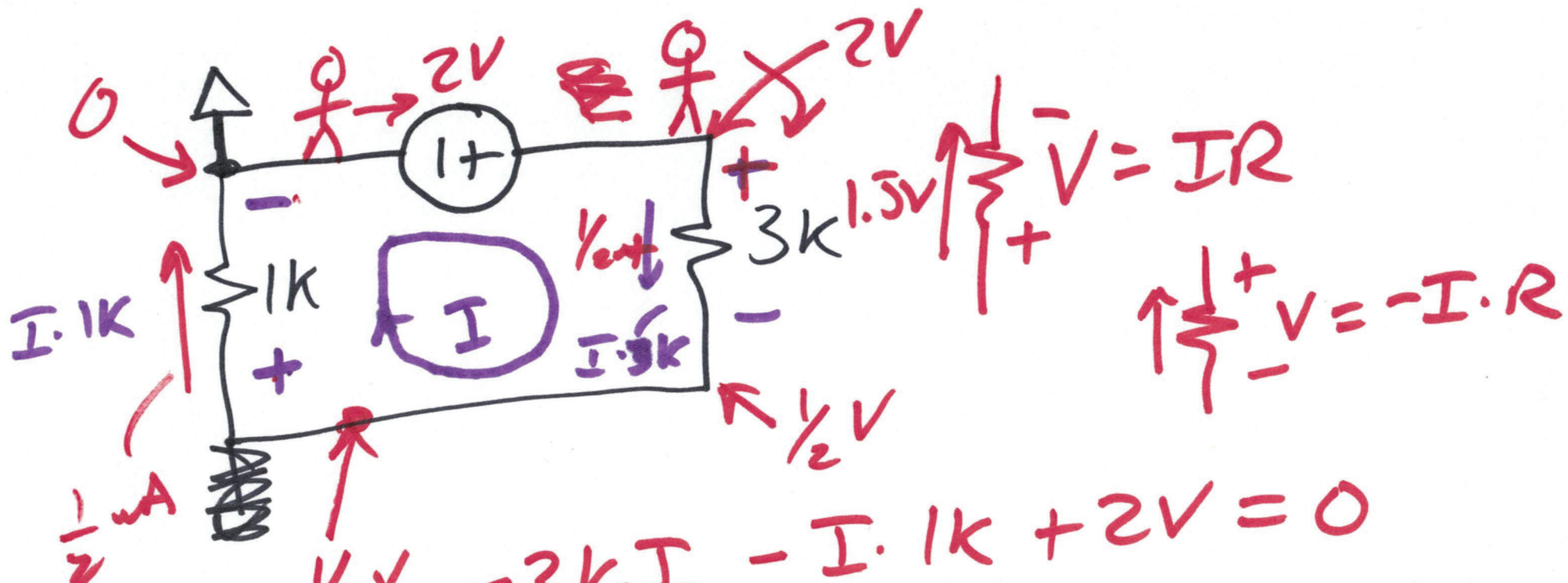


3)



4)





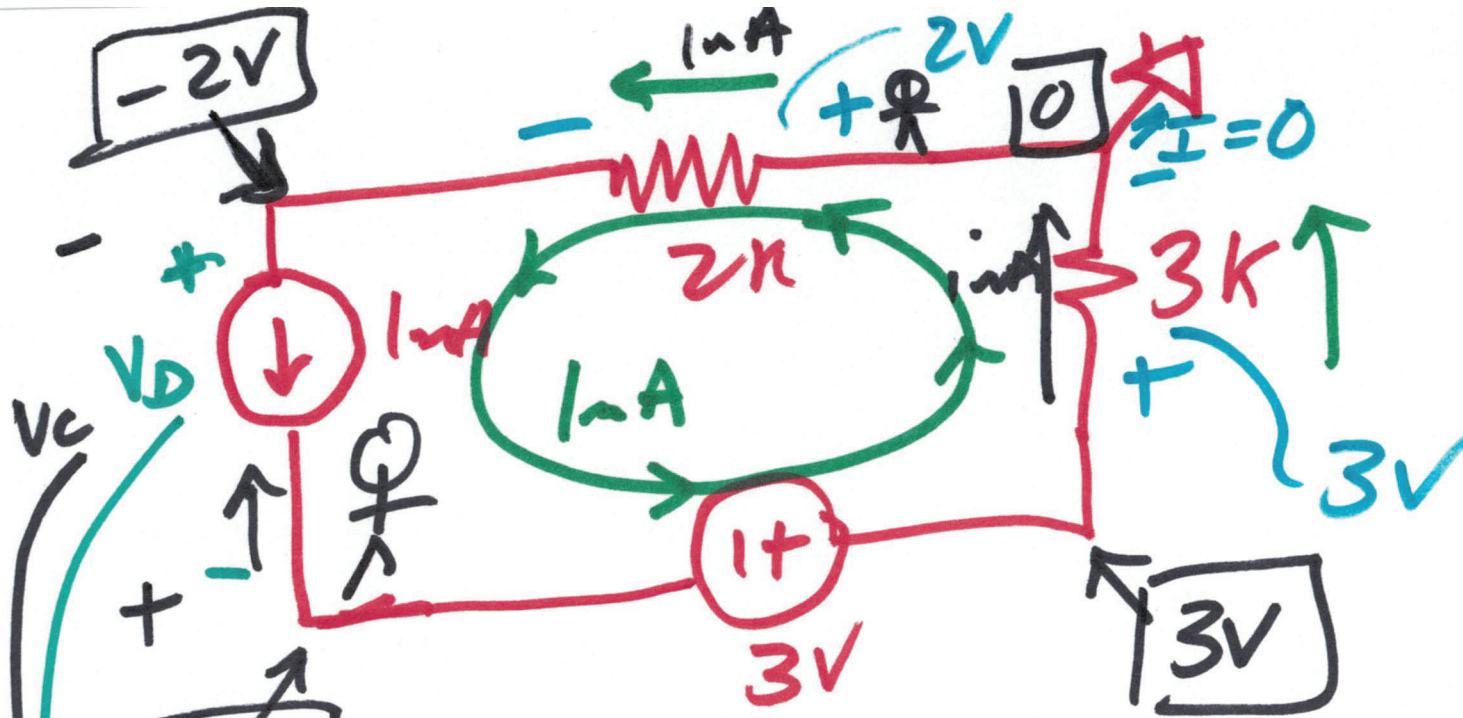
$$\frac{1}{2}V - 3k \cdot I - I \cdot 1k + 2V = 0$$

$$\frac{1}{2}A \cdot 1k = \frac{1}{2}V$$

$$4k \cdot I = 2V$$

$$I = \frac{2}{4k} = \frac{1}{2} \frac{1}{k} = \frac{1}{2} \mu A$$

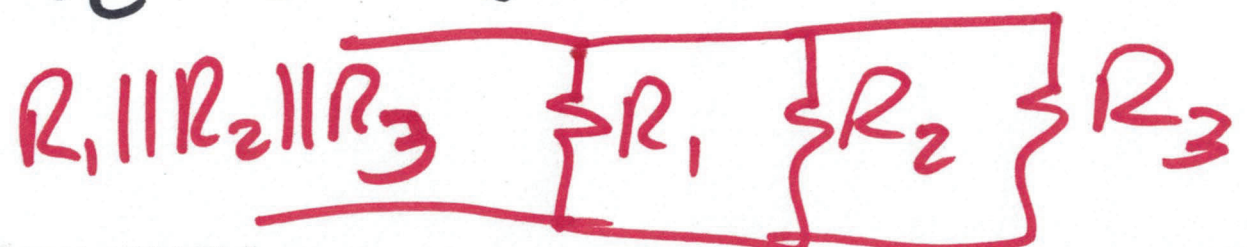
(b)



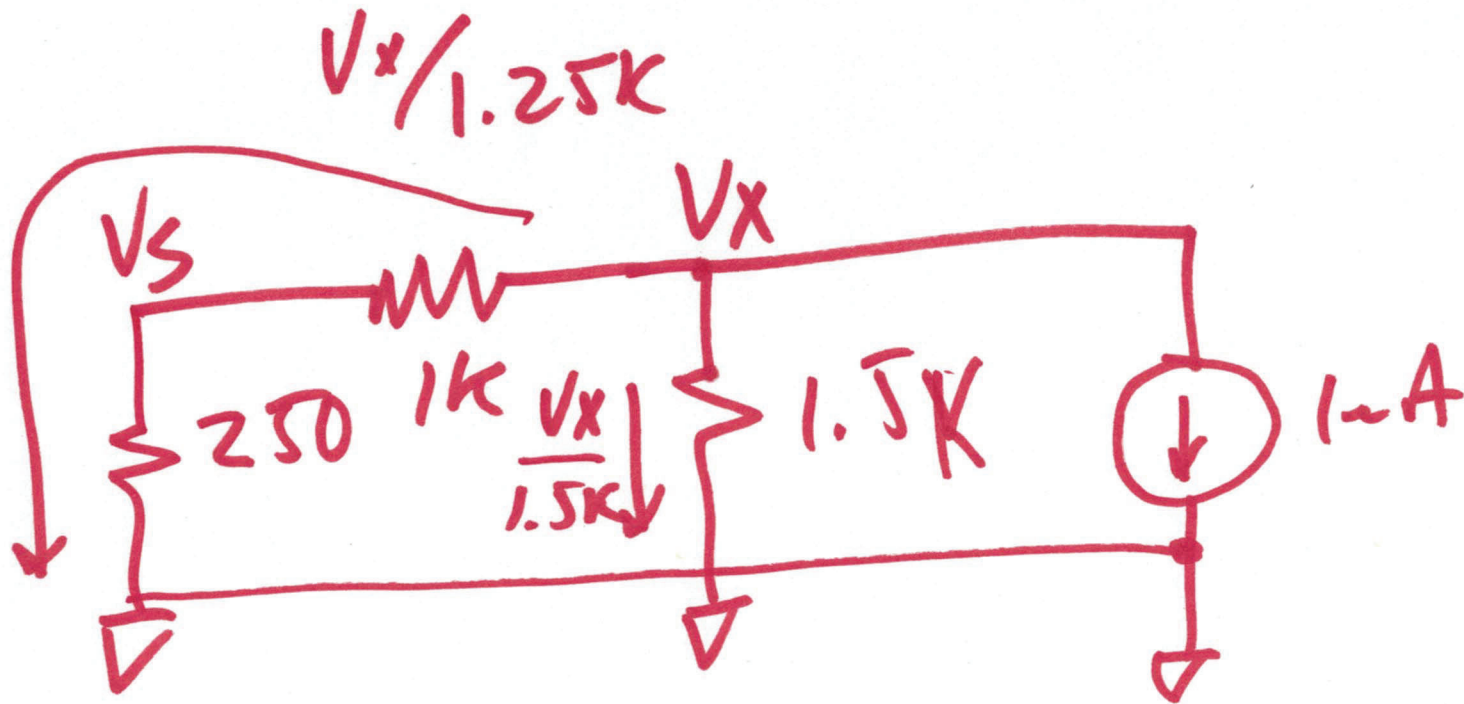
$$-2 - 0 = V_D = -2V$$

$$V_C = 0 - (-2) = +2V$$

$$\frac{1}{R} = \frac{1}{20} + \frac{1}{30} + \frac{1}{40}$$



7)



$$V_X = V_X \cdot \frac{250}{250 + 1000}$$

$$\frac{V_X}{1.25k} + \frac{V_X}{1.5k} + 1mA = 0$$