

EE 220
Circuits I

Sept. 13

Lecture 5

study session

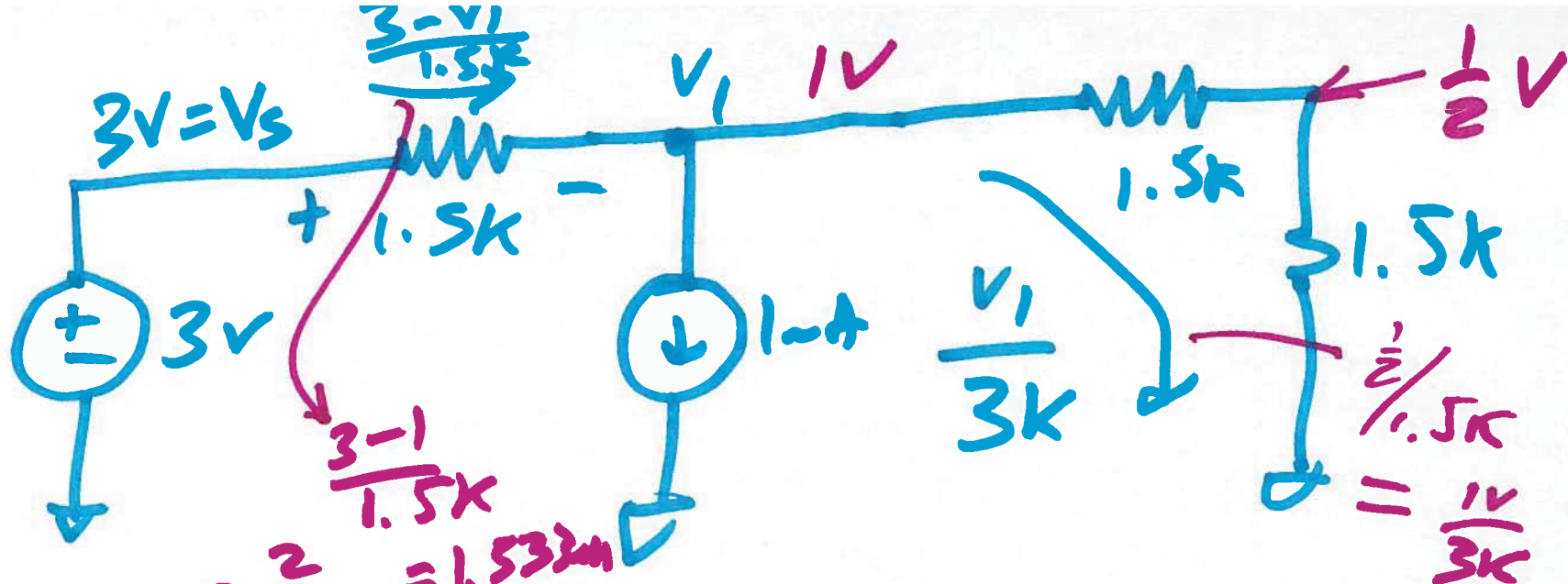
Saturday @ 2:00 pm

Sept. 16

Some room in

TBE B





$$\frac{3 - V_1}{1.5k} = \frac{3 - 1}{1.5k} = \frac{2}{1.5k} = 1.533 \text{mA}$$

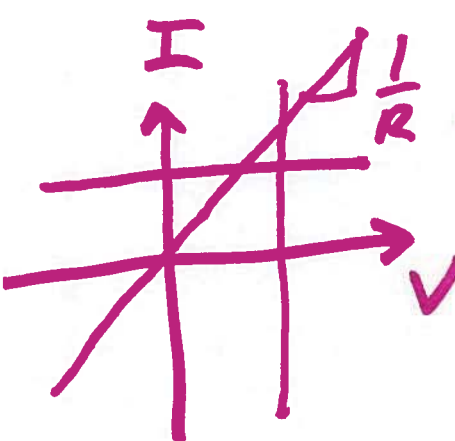
$$\frac{\frac{1}{2} V}{1.5k} = \frac{\frac{1}{2} \cdot 1}{1.5k} = \frac{1}{3k} = 333 \mu\text{A} = 0.333 \text{mA}$$

$$\frac{3 - V_1}{1.5k} = 1 \text{mA} + \frac{V_1}{3k}$$

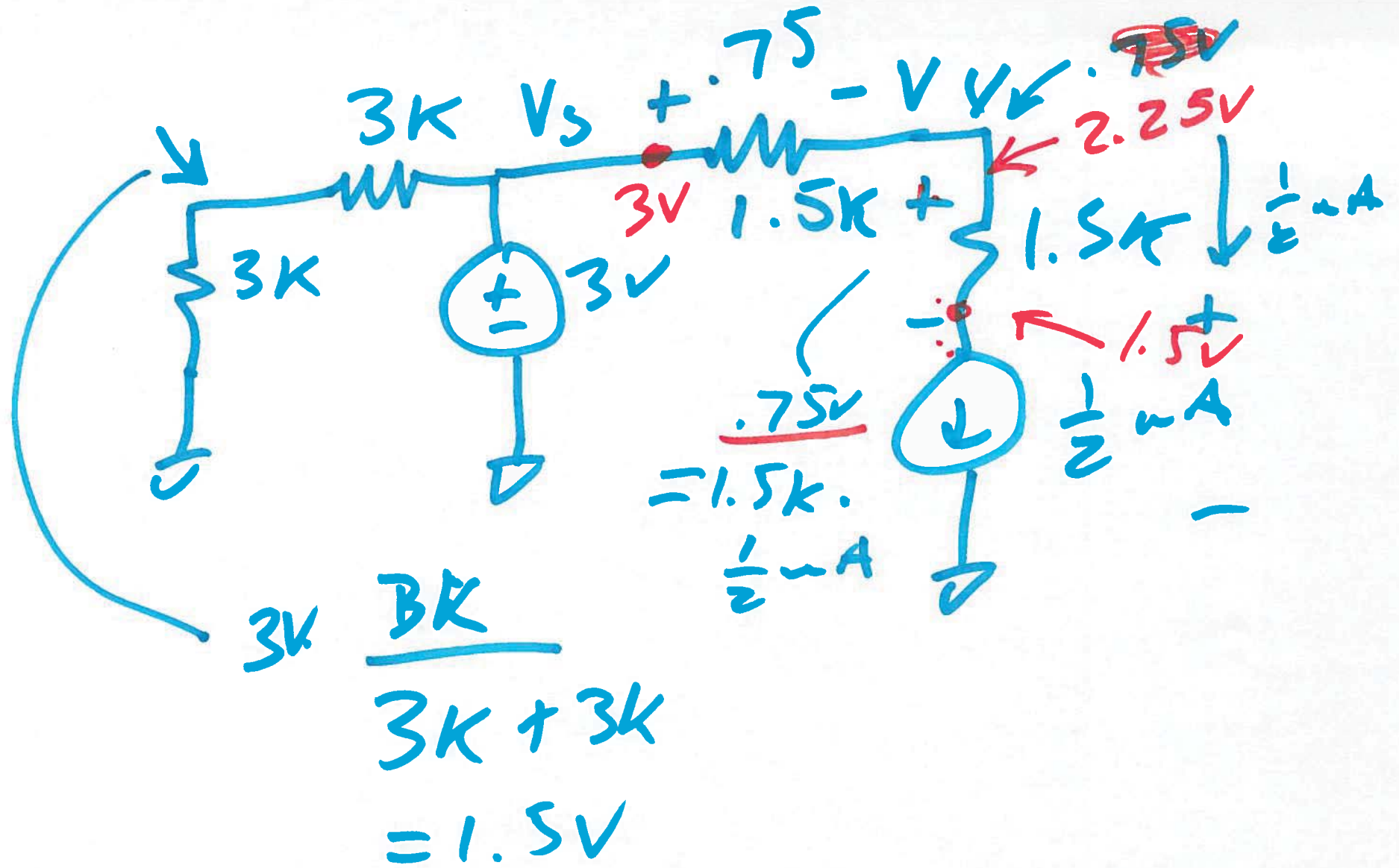
$$6 - 2V_1 = 3V + V_1$$

$$3 = 3V_1$$

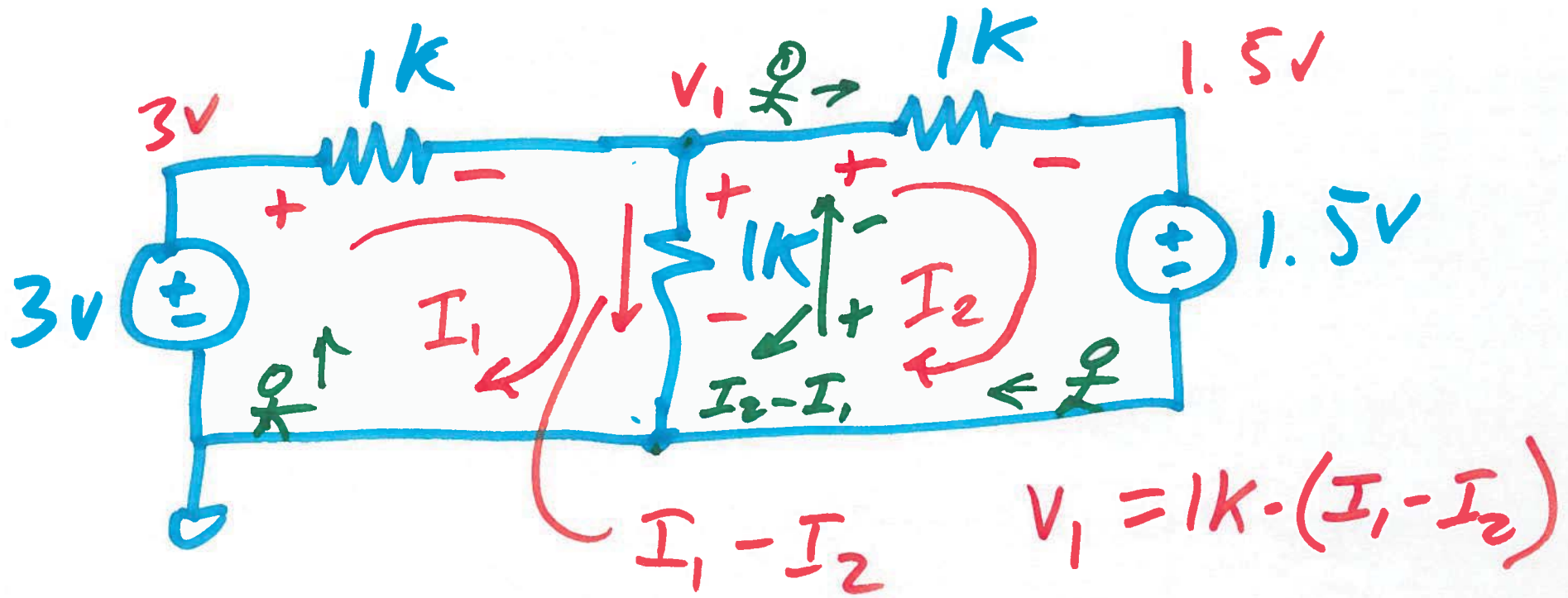
$$\boxed{V_1 = 1V}$$



3)



Mesh Analysis

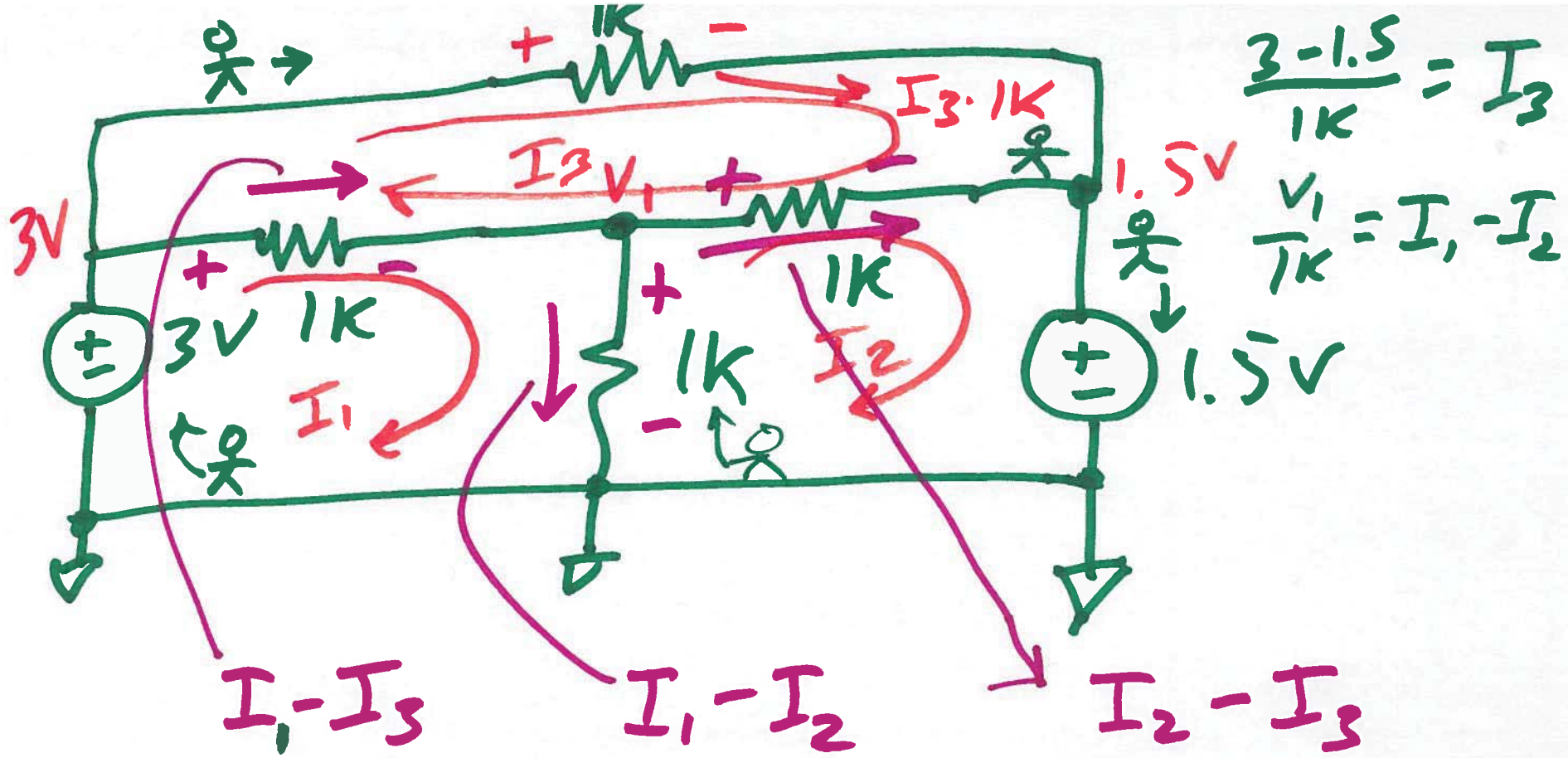


$$1k \cdot (I_2 - I_1) = -V_1$$

$$* +3V - I_1 \cdot 1k - 1k(I_1 - I_2) = 0$$

$$+ 1k(I_1 - I_2) - 1k \cdot I_2 - 1.5V = 0$$

5)

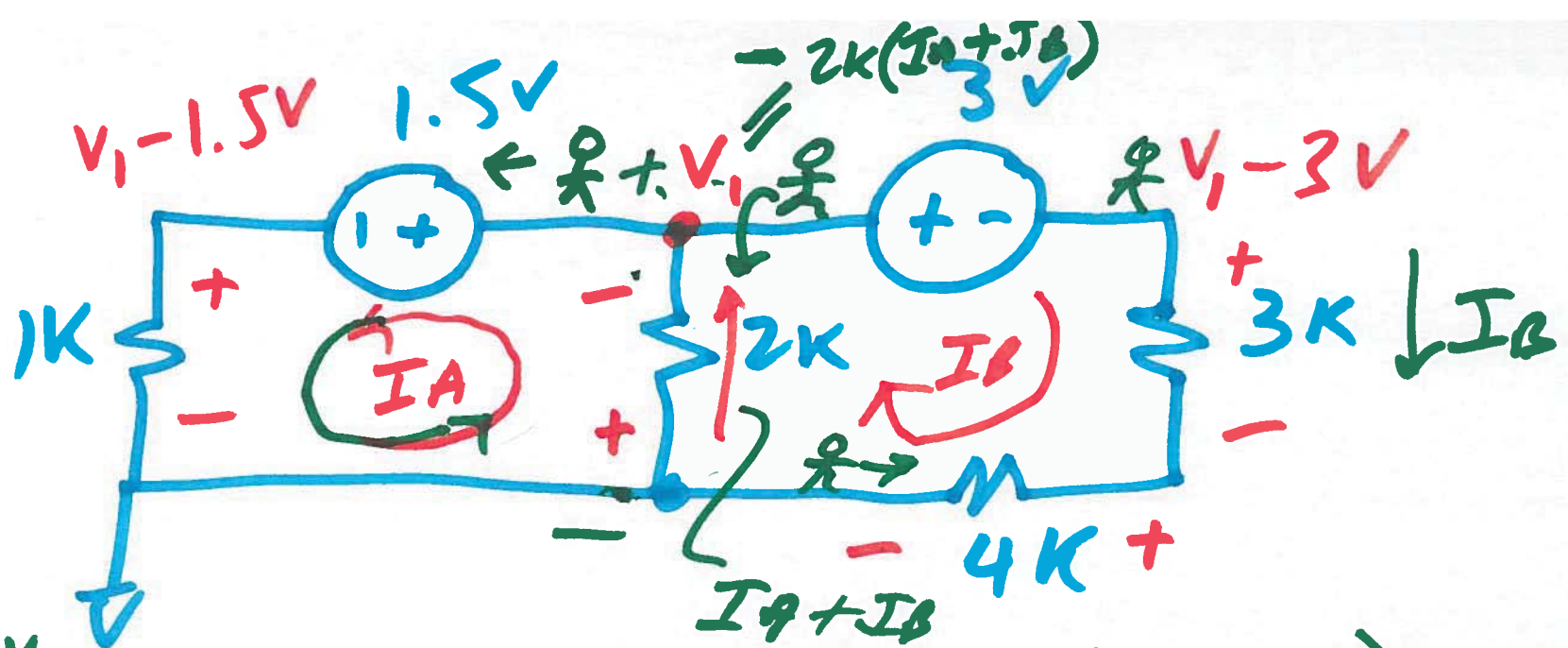


① $+3V - 1K(I_1 - I_3) - 1K(I_1 - I_2) = 0$

② $-1.5V + 1K(I_1 - I_2) - 1K(I_2 - I_3) = 0$

③ $-1K \cdot I_3 + 1K(I_2 - I_3) + 1K \cdot (I_1 - I_2) = 0$

b)



$$-1.5 - \frac{1k \cdot I_A}{2k} - \frac{2k \cdot (I_A + I_B)}{2k} = 0$$

$$+ \frac{2k(I_A + I_B)}{2k} + 4k \cdot I_B + 3k I_B + 3V = 0$$

$$+V = V_+ - V_-$$

$$-0.75mA - \frac{1}{2} I_A - I_A - I_B = 0$$

$$I_B = -\frac{3}{4} mA - \frac{3}{2} I_A$$

7)

$$I_B = - \left(\frac{3}{4} \mu A + \frac{3}{2} I_A \right)$$

$$\frac{1}{2} I_A + \frac{1}{2} I_B + I_B + \frac{3}{4} I_D + \frac{3}{4} \mu A = 0$$

$$\frac{1}{2} I_A + \frac{9}{4} I_D + \frac{3}{4} \mu A = 0$$

$$I_A = \frac{-15 \cdot 8}{23 \cdot 16}$$

$$= \frac{-120}{368}$$

$$\frac{1}{2} I_A + \frac{9}{4} \left(\frac{3}{4} \mu A + \frac{3}{2} I_A \right) + \frac{3}{4} \mu A = 0$$

$$\frac{1}{2} I_A - \frac{27}{16} \mu A - \frac{27}{8} I_A + \frac{3}{4} \mu A = 0$$

$$-\frac{23}{8} I_A - \frac{15}{16} = 0$$

$$-\frac{23}{8} I_A = \frac{15}{16}$$