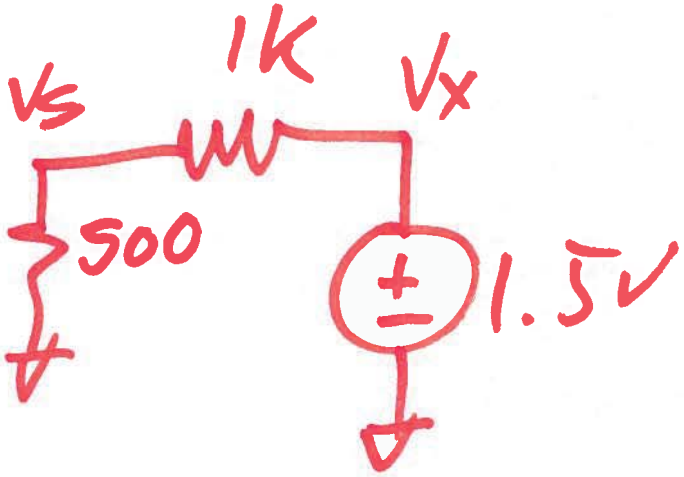
EE 220

circuits I

9/11/2017

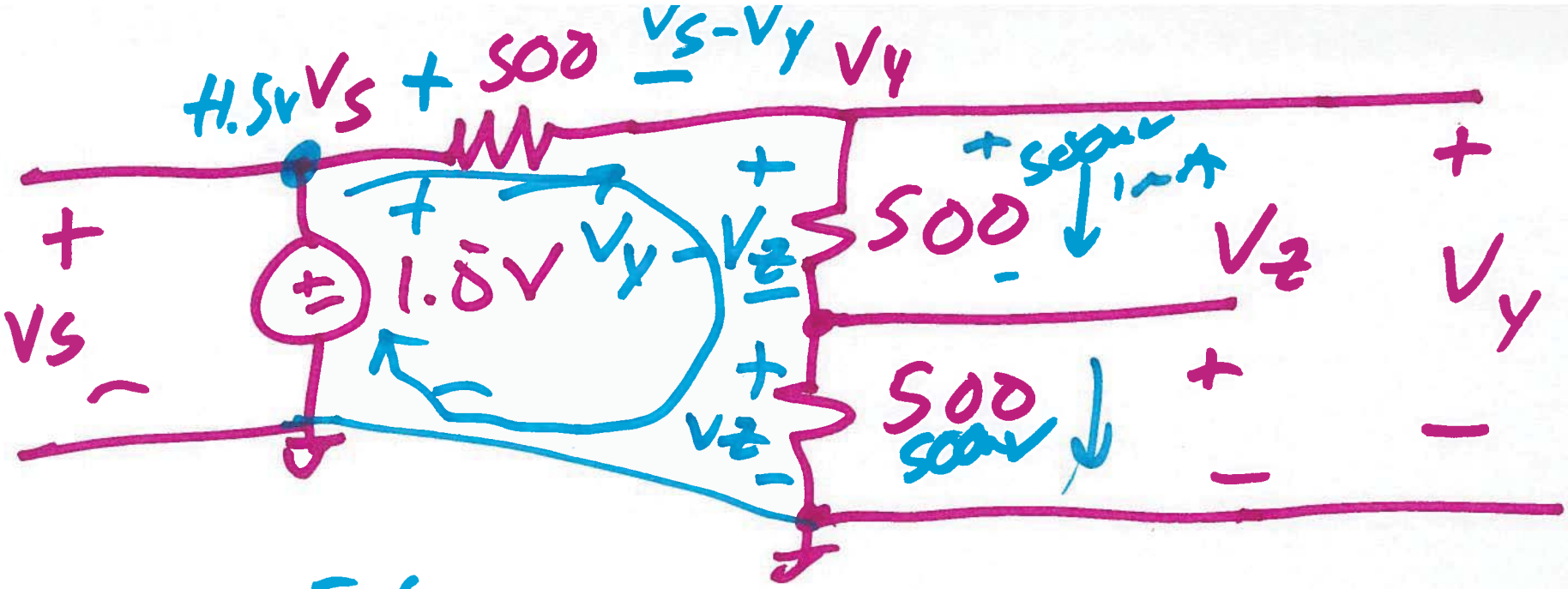
Lecture 4



$$V_s = 1.5 \cdot \frac{500}{500+1000}$$

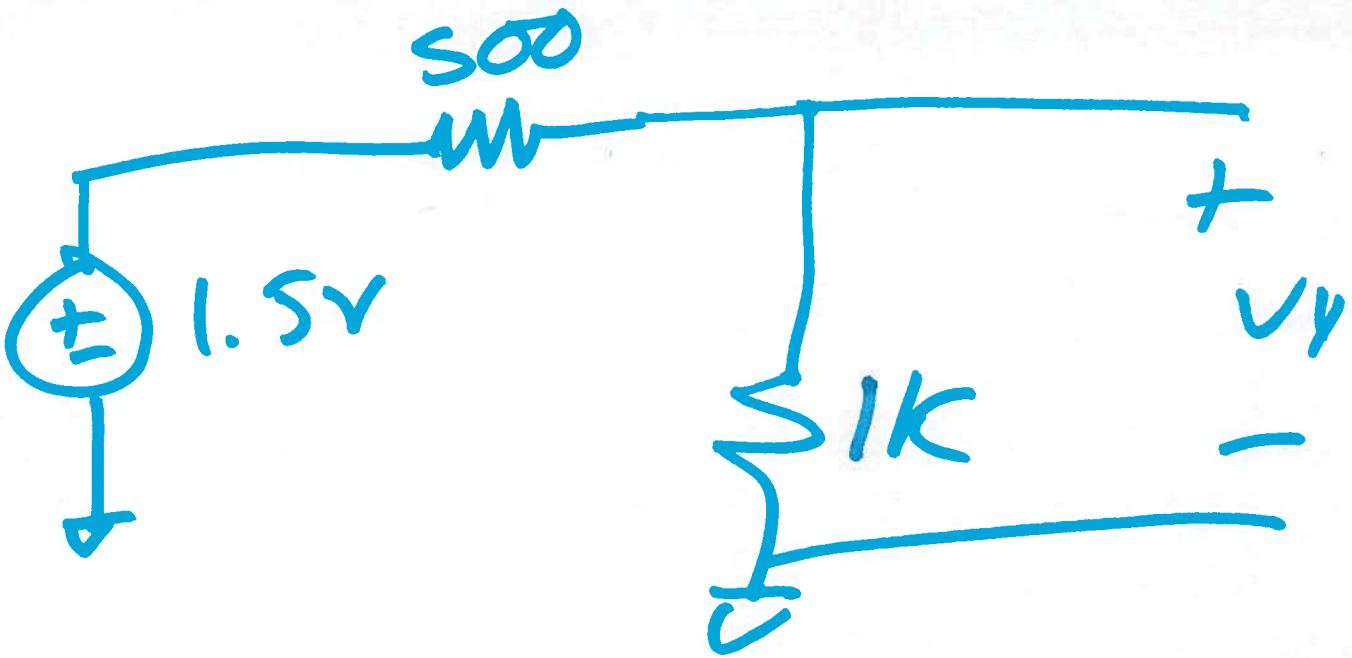
$$V_s = 0.5\,V$$

$$= 500\,mV$$



$$\frac{1.5V}{500+500+500} = \frac{1.5V}{1.5K} = 1mA$$

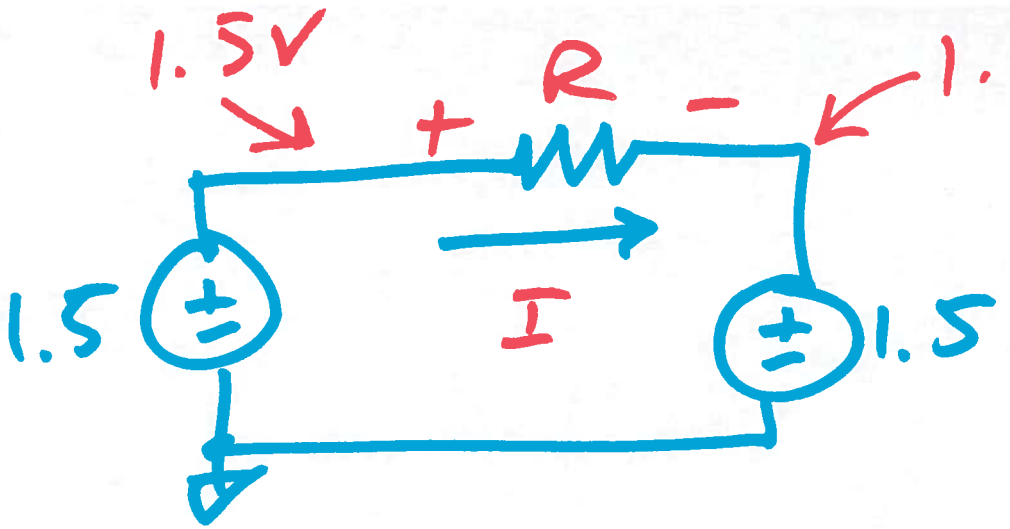
$$1.5 \quad \frac{\cdot 500}{500+500+500} =$$



$$V_y = 1.5 \cdot \frac{1K}{1K + 500}$$

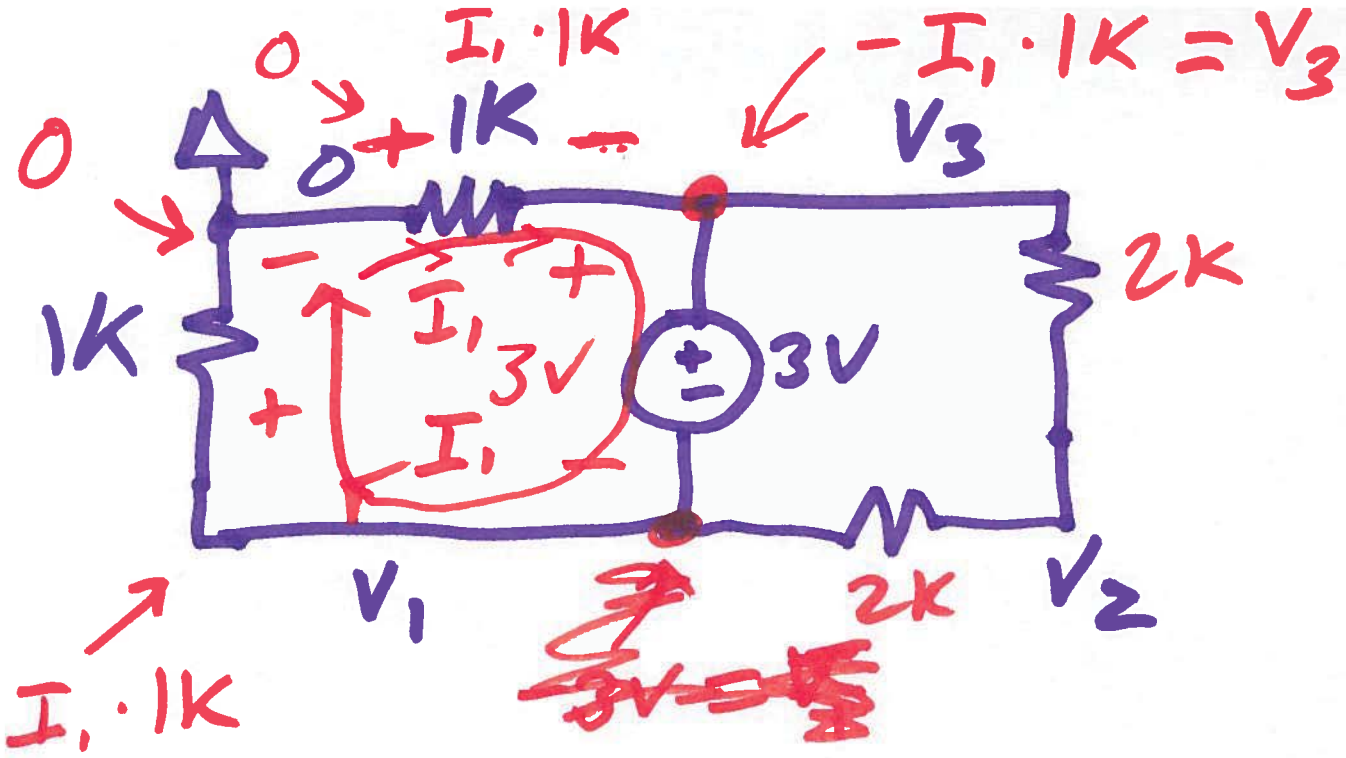
$$V_y = 1V$$

3)



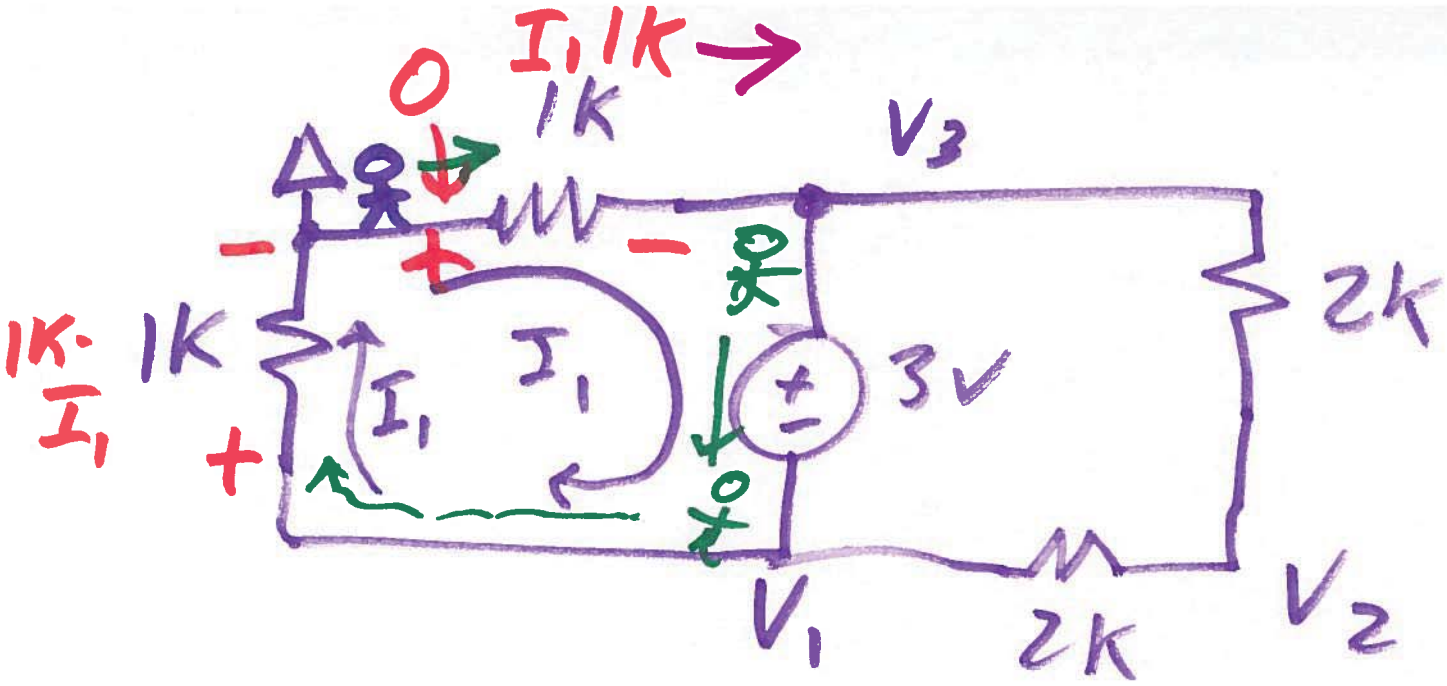
$$I = \frac{V_+ - V_-}{R} = \frac{1.5 - 1.5}{R}$$

$$\boxed{I = 0}$$



$$V_4 - V_- = I_1 \cdot 1K$$

0



$$I_1 \cdot 1k = \cancel{V_+} - \cancel{V_-}^{V_3}$$

0

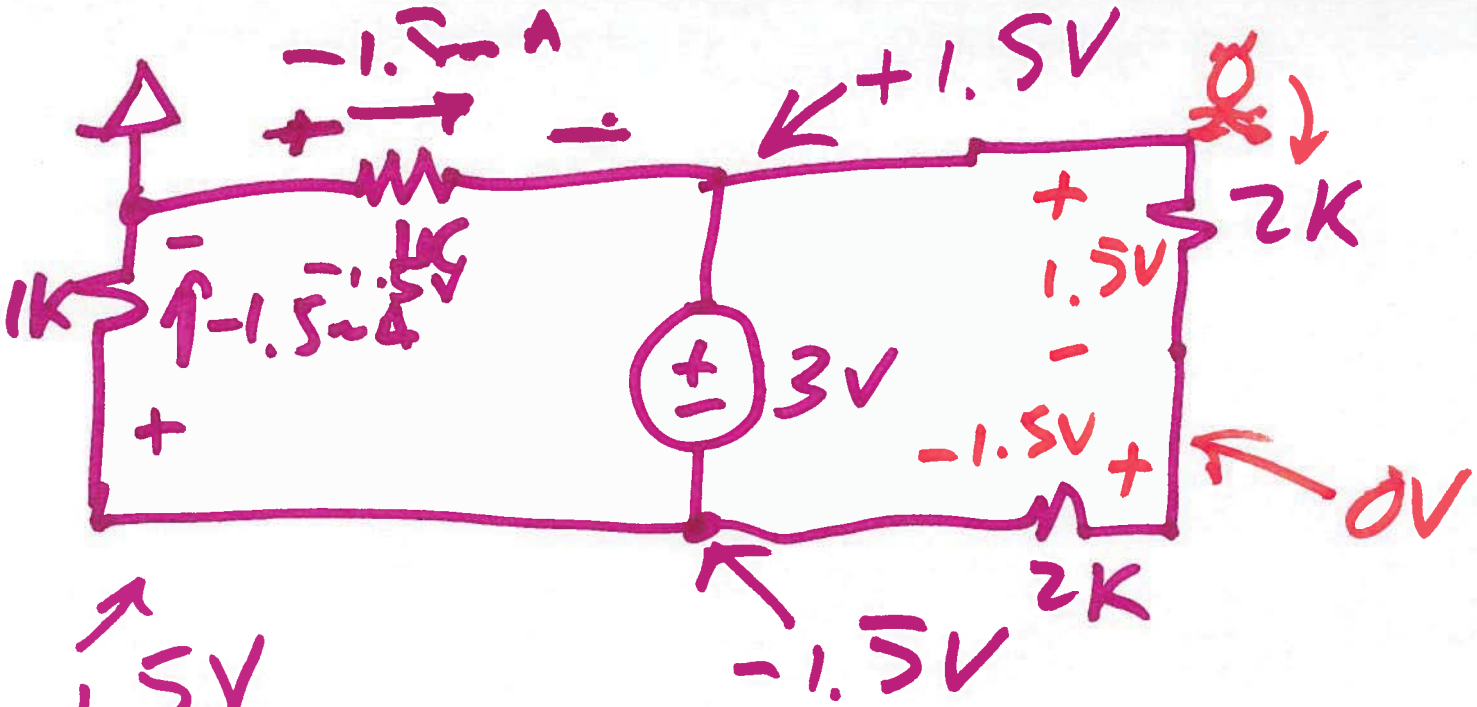
$$V_3 = -I_1 \cdot 1k$$

$$-I_1 \cdot 1K - 3V - I_1 \cdot 1K = 0$$

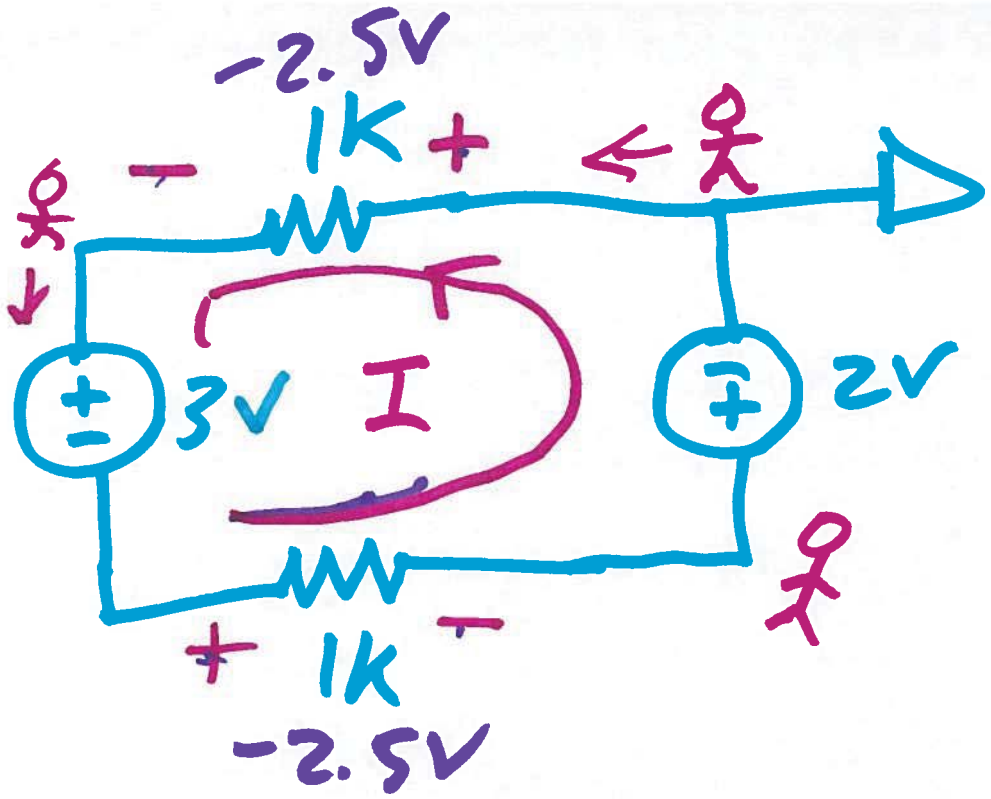
$$-3V = I_1 \cdot 2K$$

$$I_1 = -1.5\,mA$$

v)



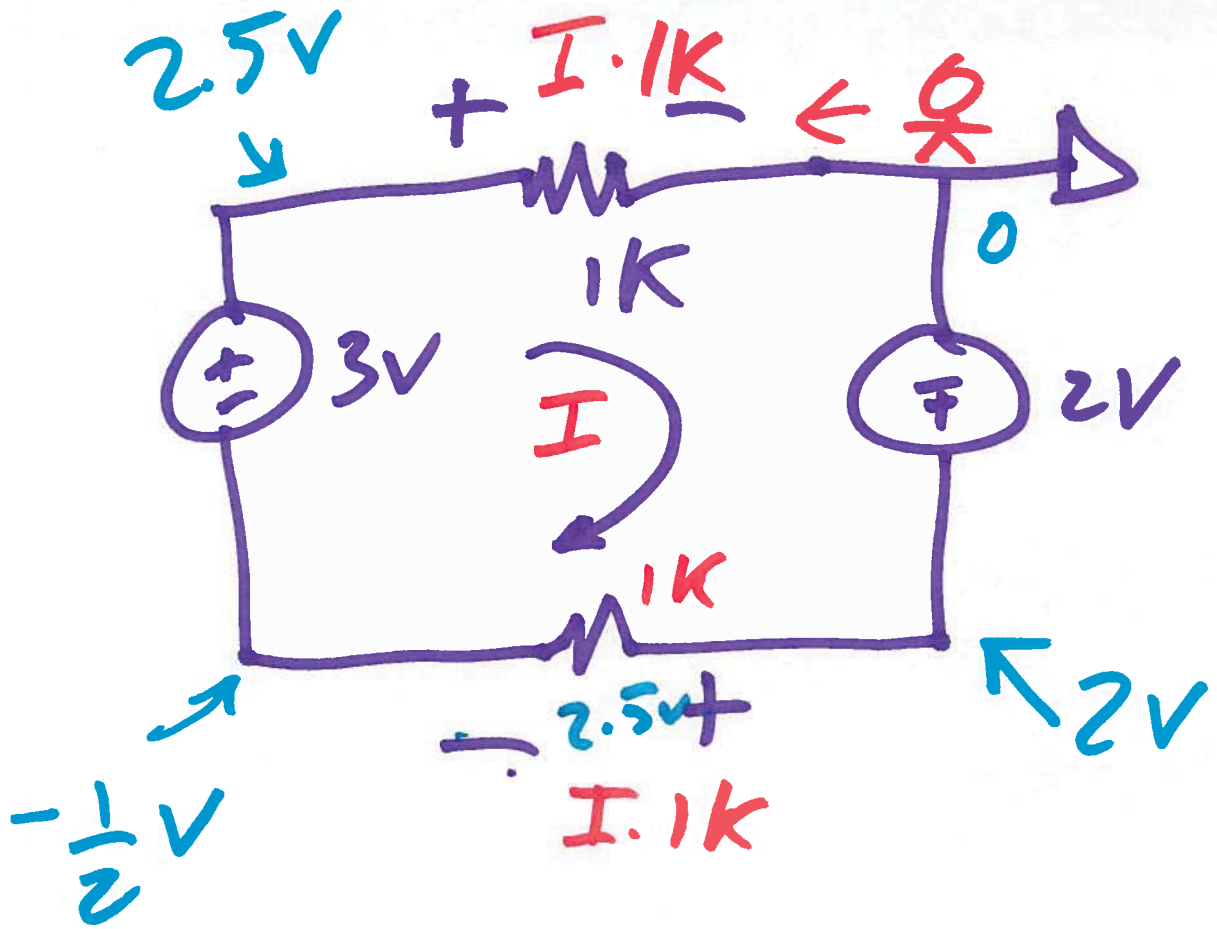
$$\frac{3V}{2K+2K} = 0.75 \sim A$$



$$-I \cdot 1k - 3 - I \cdot 1k - 2 = 0$$

$$I = \frac{-5}{2k} = -2.5\,mA$$

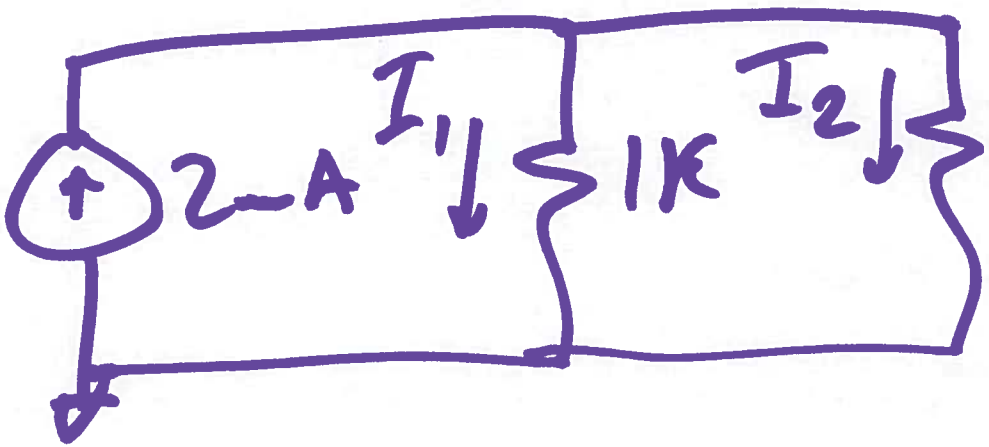
$$-(-2.5V) - 3 - (-2.5) - 2 = 0$$



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

$$I = +2.5 mA$$

current divider

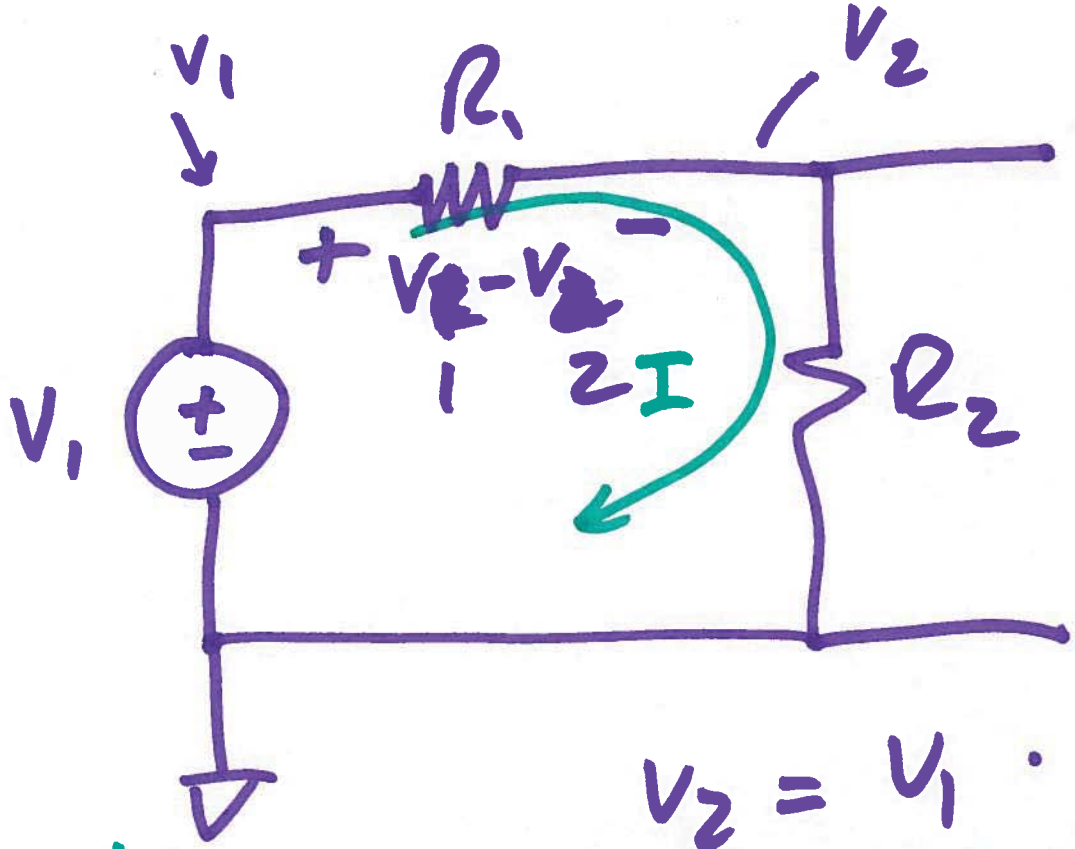


$I_1 + I_2 = .002$

$$I_1 = 2mA \cdot \frac{2K}{2K+1K}$$

$$I_2 = 2mA \cdot \frac{1K}{2K+1K}$$

Voltage division



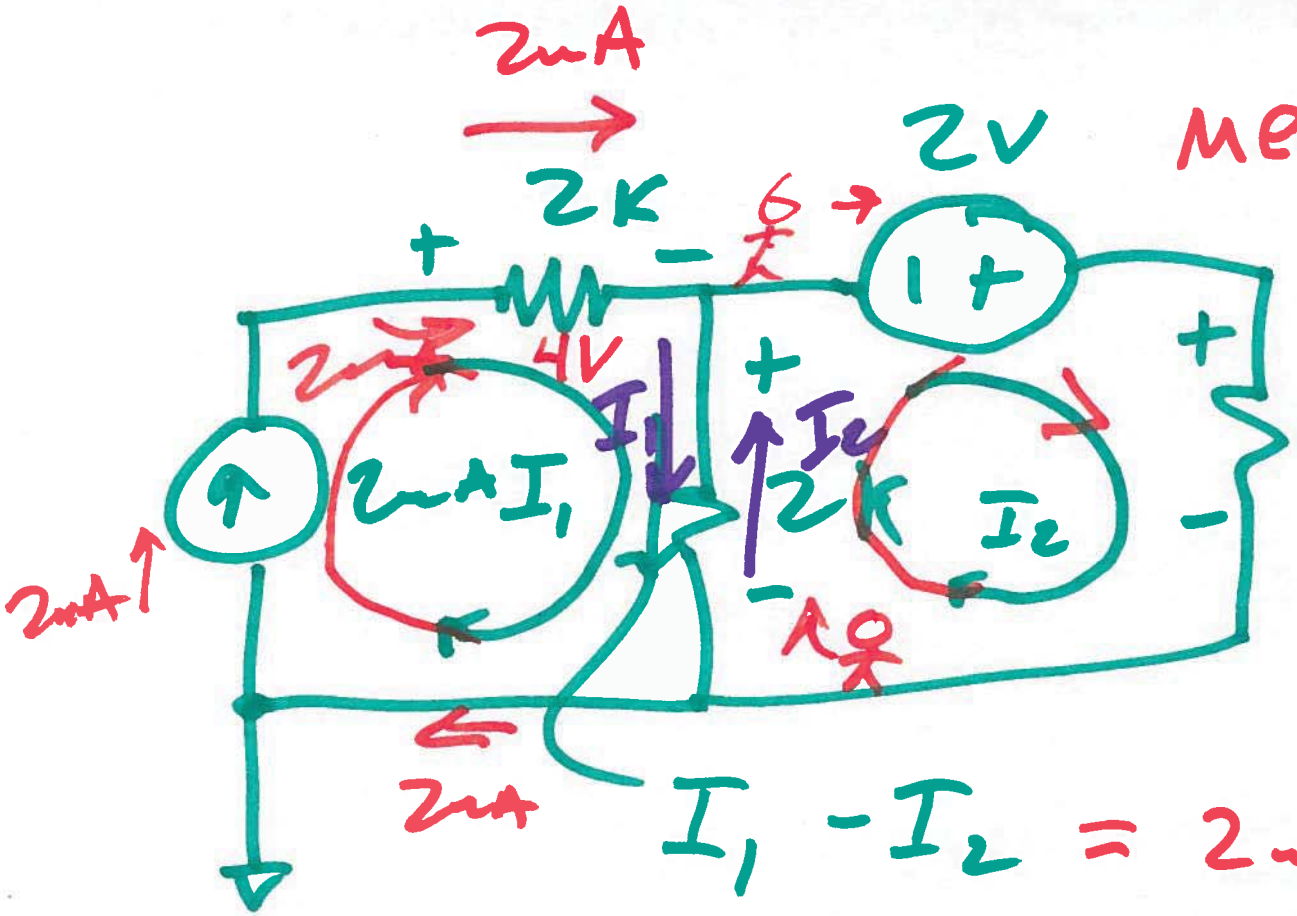
$$V_2 = I \cdot R_2$$

$$+ = V_1 \cdot \frac{R_2}{R_1 + R_2}$$

$$I = \frac{V_1}{R_1 + R_2}$$

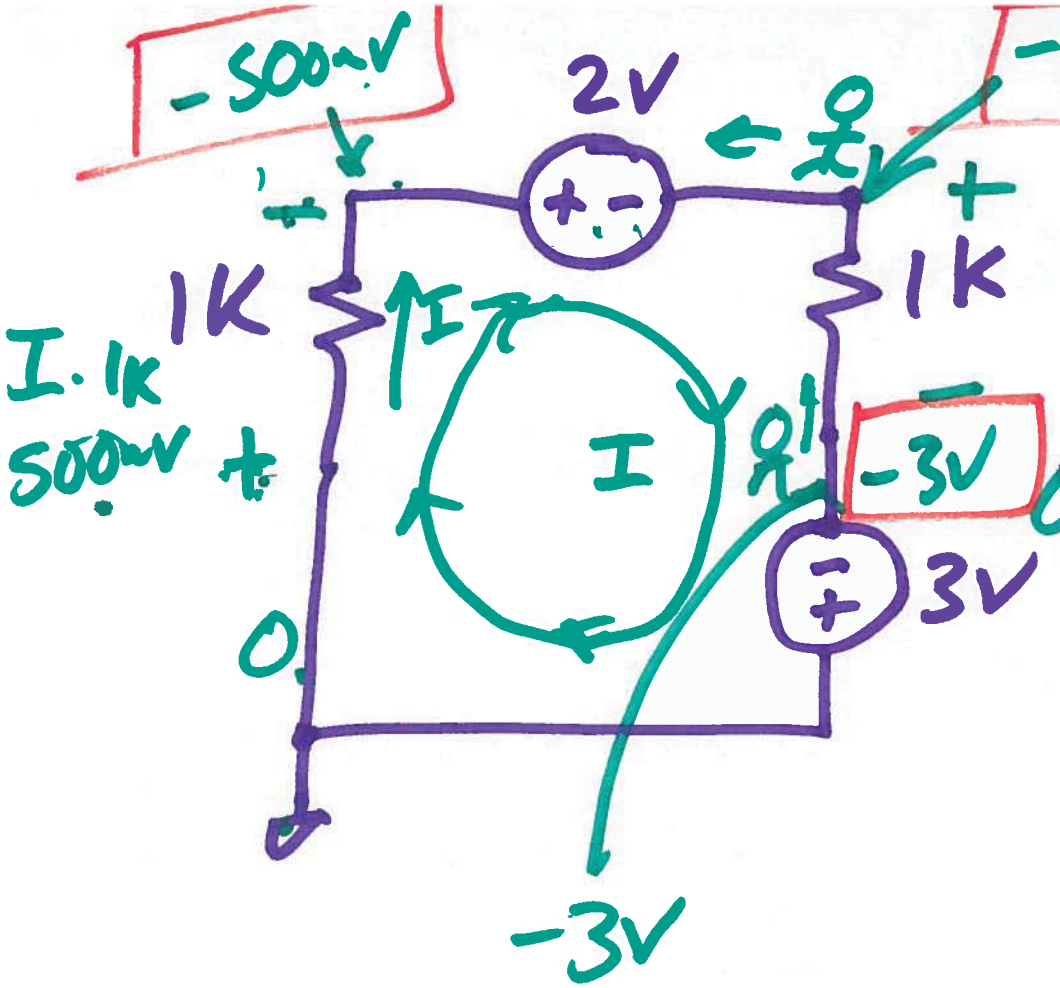
$$V_2 = V_1 \cdot \frac{R_2}{R_1 + R_2}$$

$$V_1 - V_2 = V_1 \cdot \frac{R_1}{R_1 + R_2}$$



$$I_1 - I_2 = 2\text{mA} - I_2$$

$$+ 2\text{K}(2\text{mA} - I_2) + 2\text{V} - 4\text{K} \cdot I_2 = 0$$



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

KVL

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

$1V = I \cdot 2k$

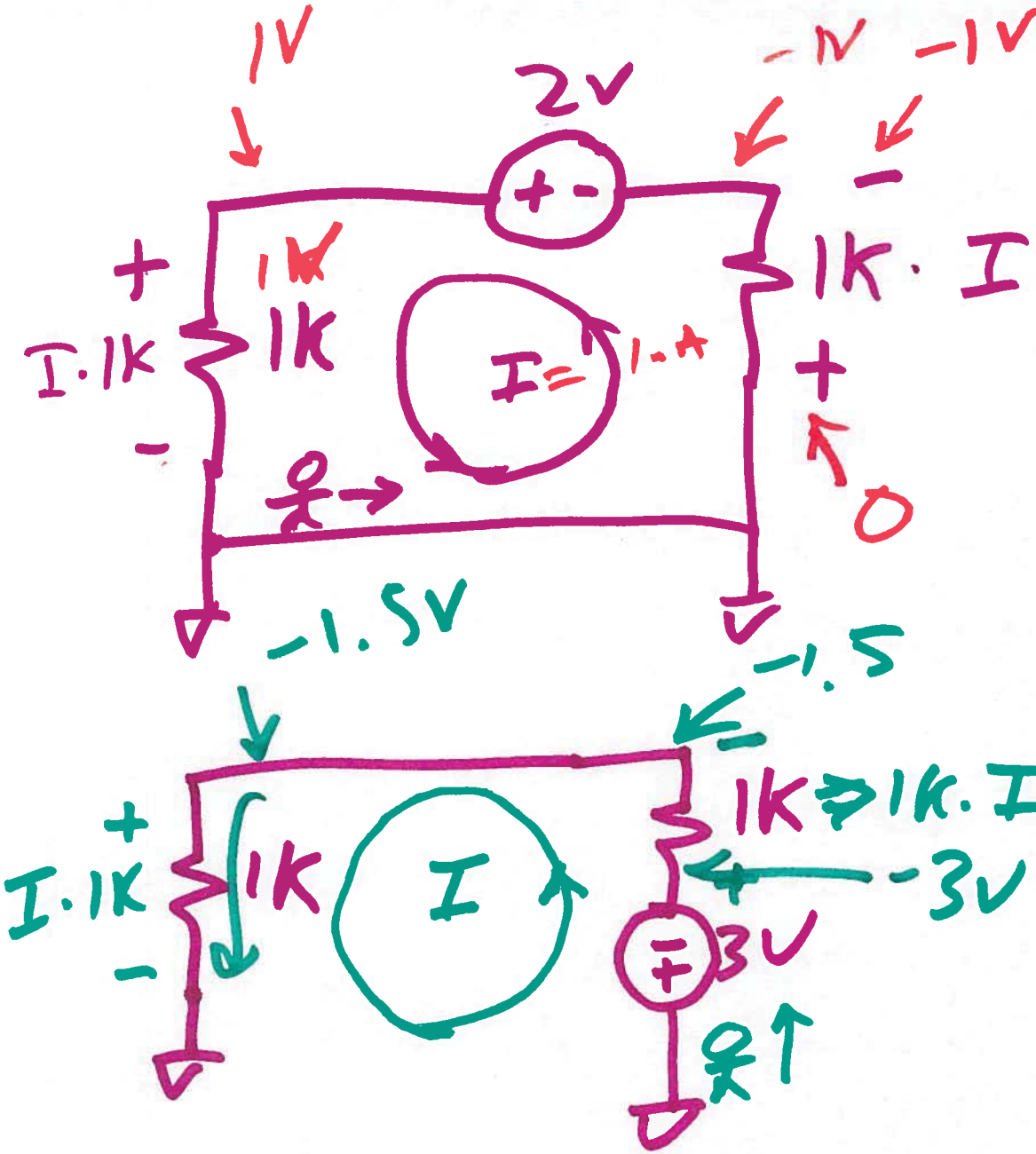
10^{-6}

$I = 500\mu A$

$= \frac{1}{2} mA = 0.0005A$

Voltage sources → short

current sources → open



$$-1k \cdot I + 2 - I \cdot 1k =$$

$$I = \frac{2}{2k} = 1mA$$

$$-3V - I \cdot 1k - I \cdot 1k =$$

$$I = -1.5mA$$