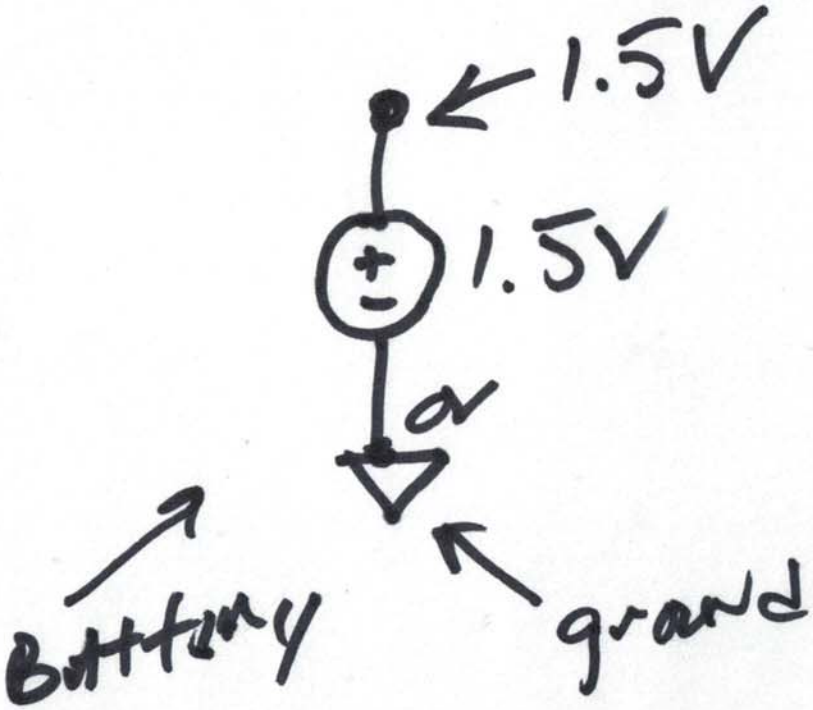
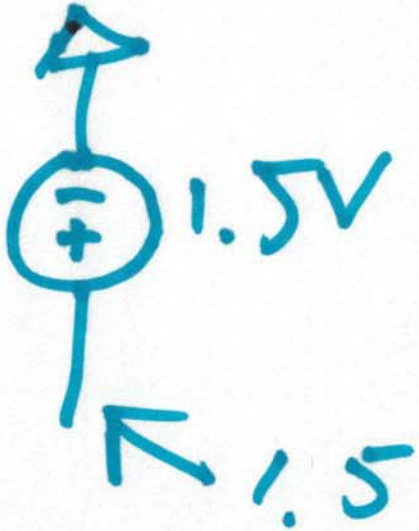
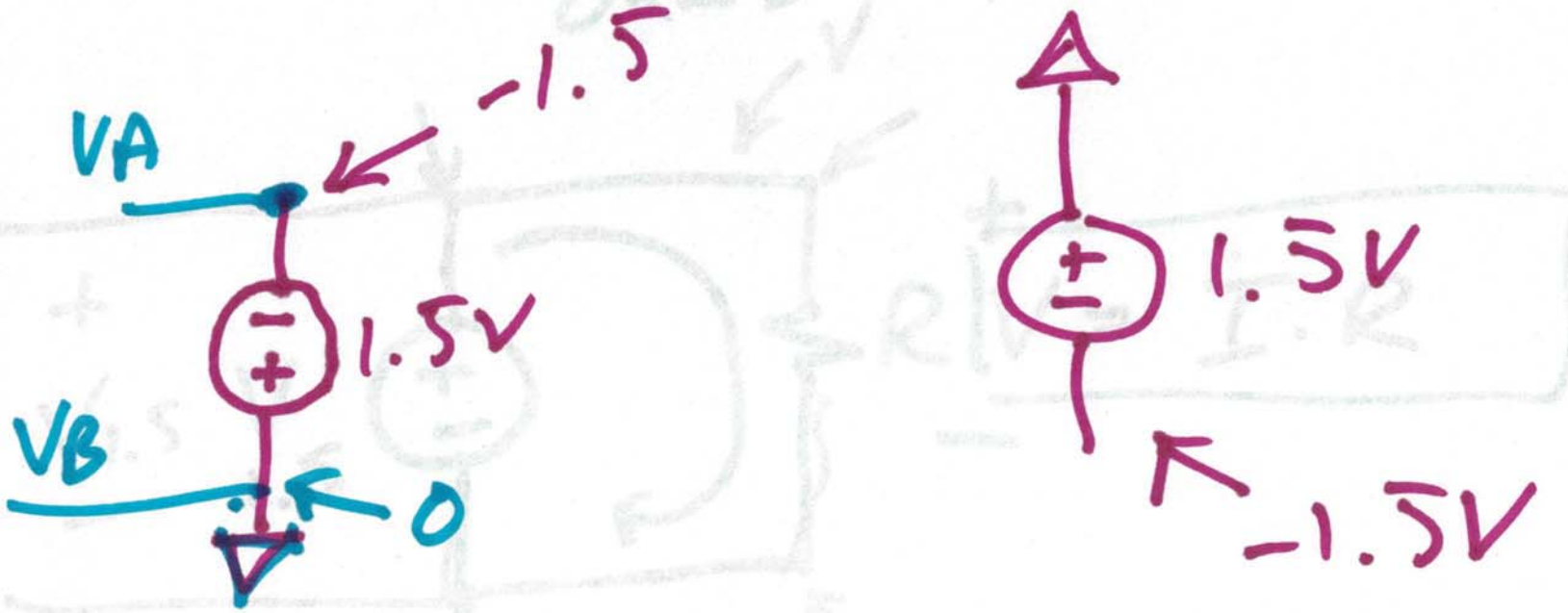
EE 220 Circuits I

August 26, 2019

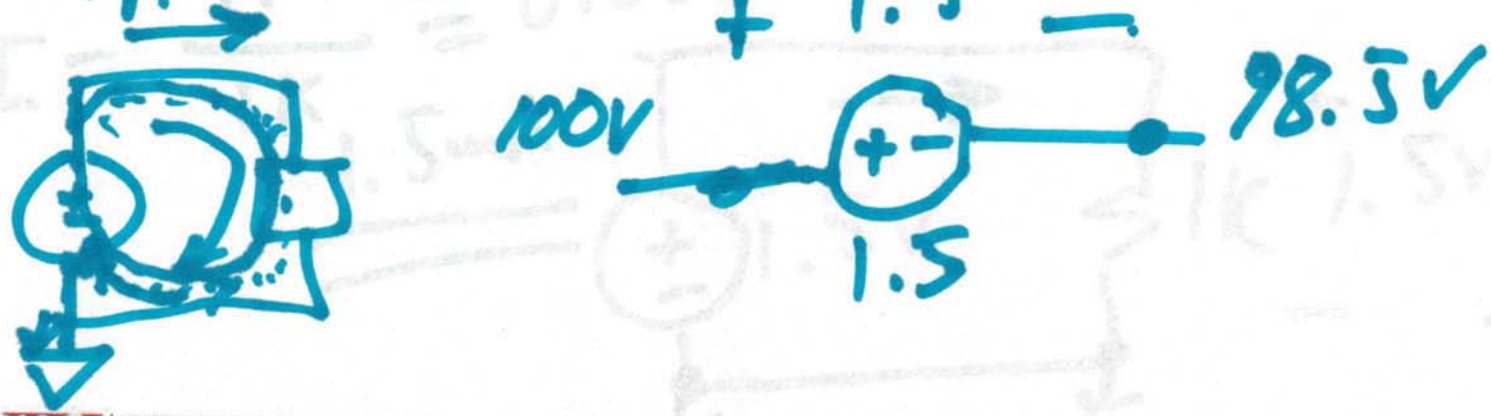
Lecture 1

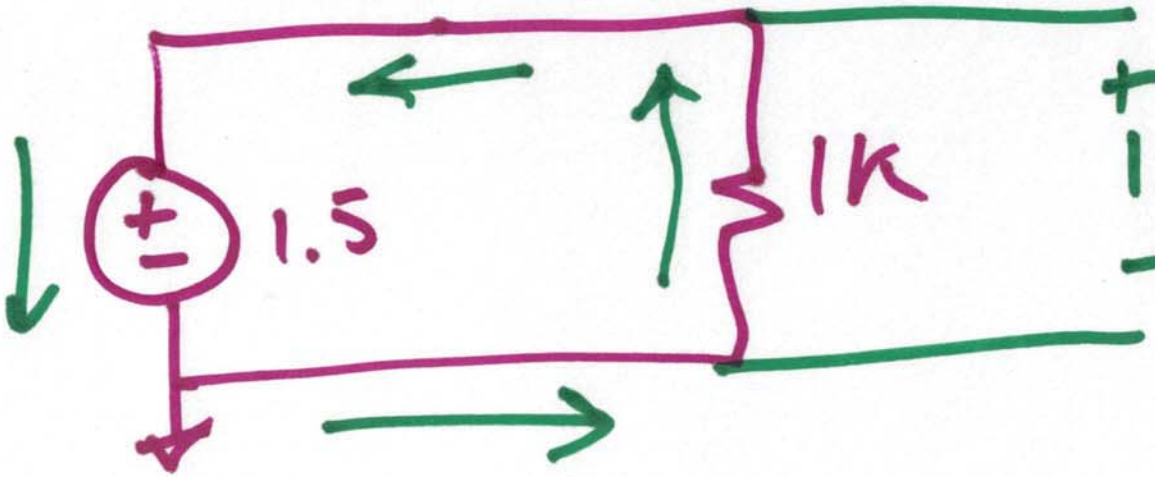






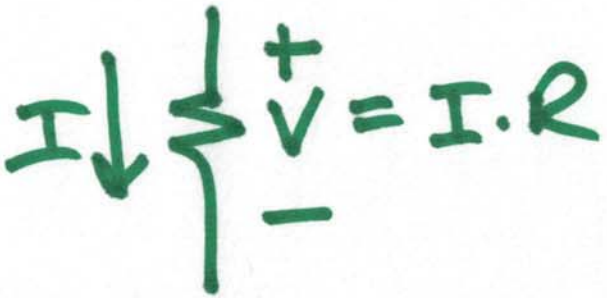
$V_A - V_B = -1.5 - 0$



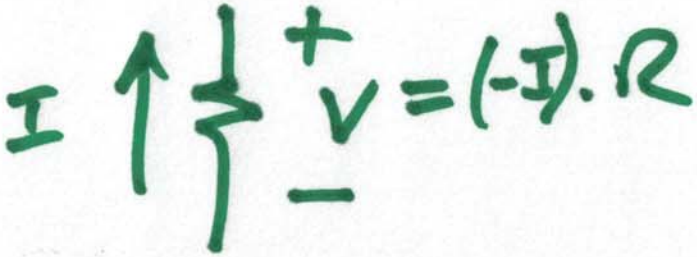


$+\ 1.5V = -I \cdot 1k\ -$

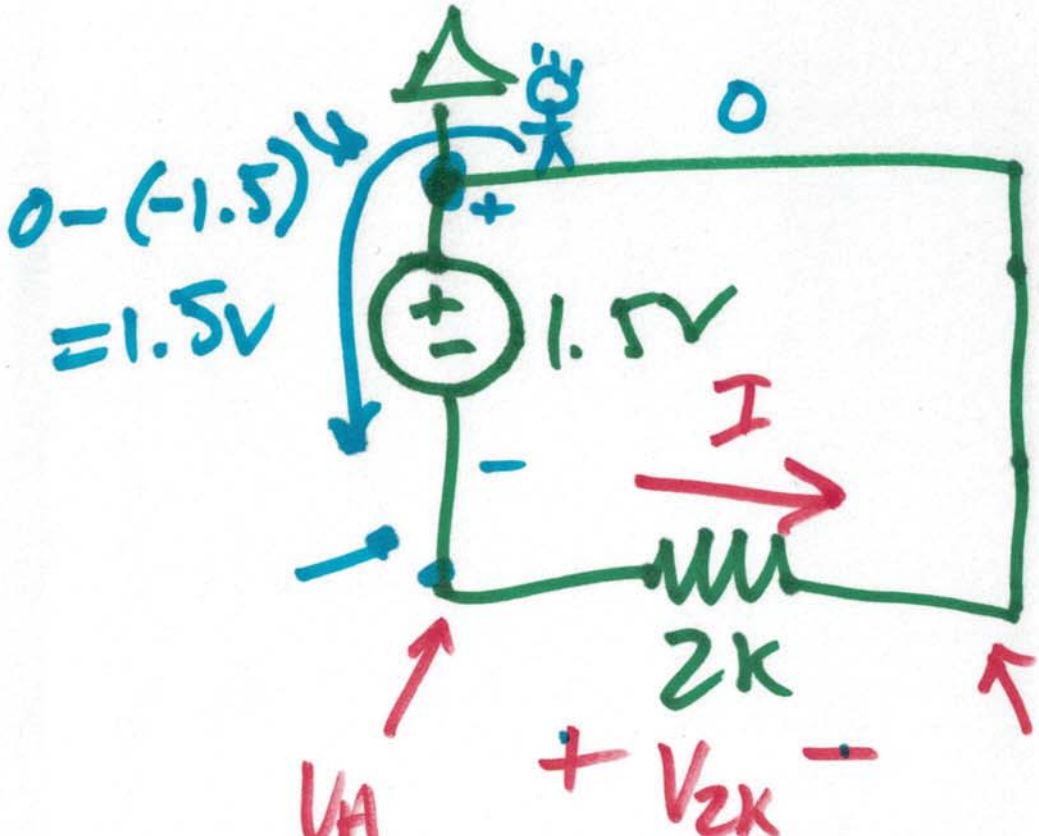
$I = -1.5mA$

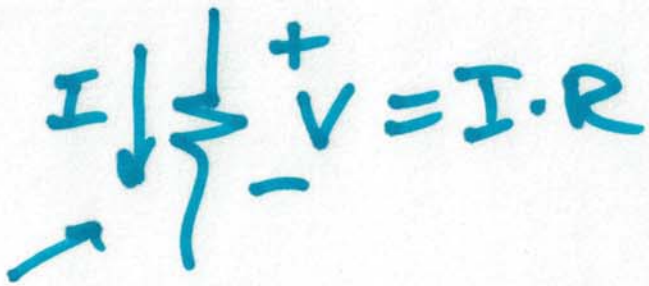


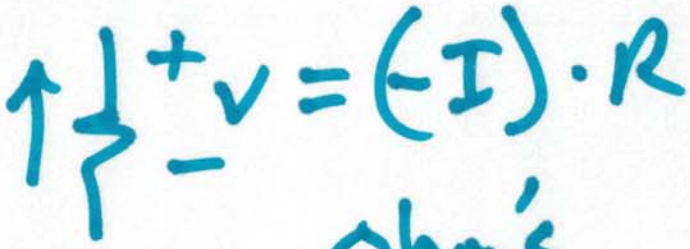
$V = I \cdot R$



$V = (-I) \cdot R$







$$V_{2K} = V_A - V_B = V_A = -1.5V$$

$$I = \frac{V_{2K}}{R} = \frac{-1.5V}{2K} = -750\mu A = -\frac{3}{4}mA$$

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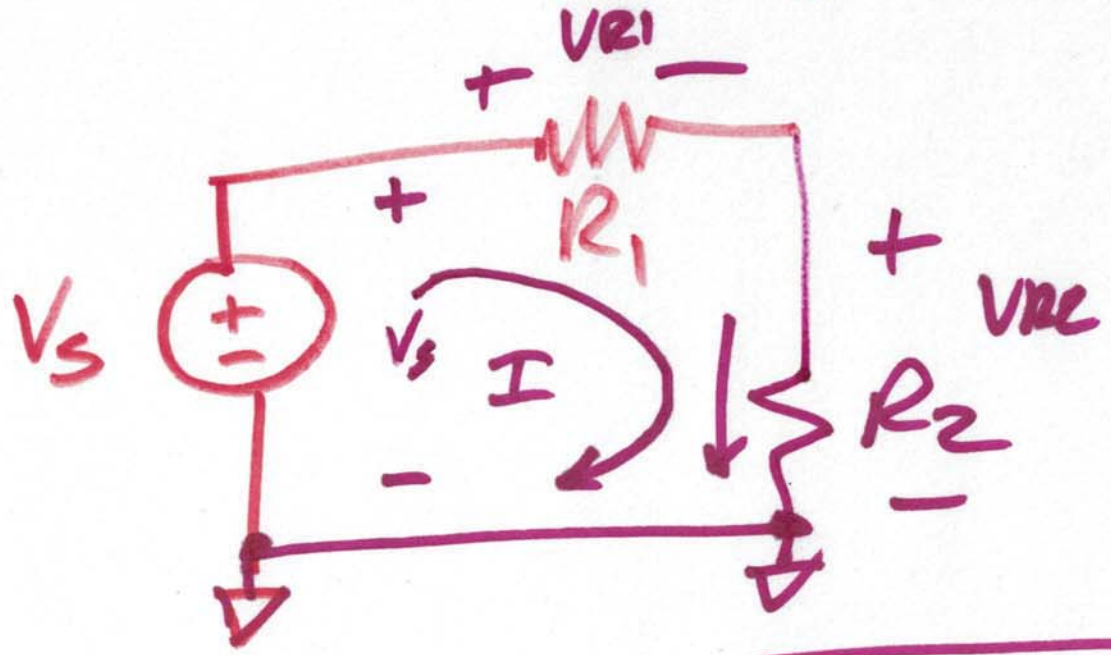
5)

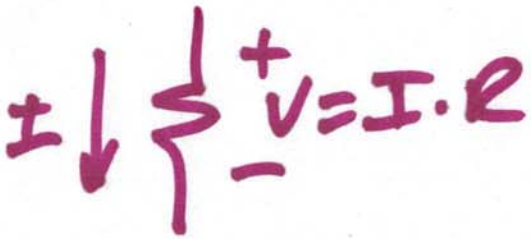
Voltage divider

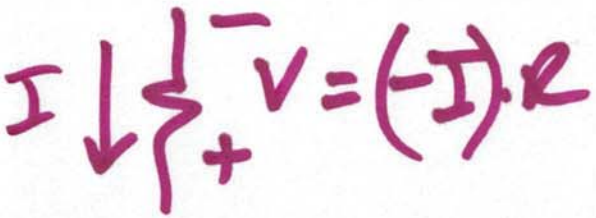


$$I = \frac{V_s}{R_1 + R_2}$$

$$V_{R1} = I \cdot R_1$$

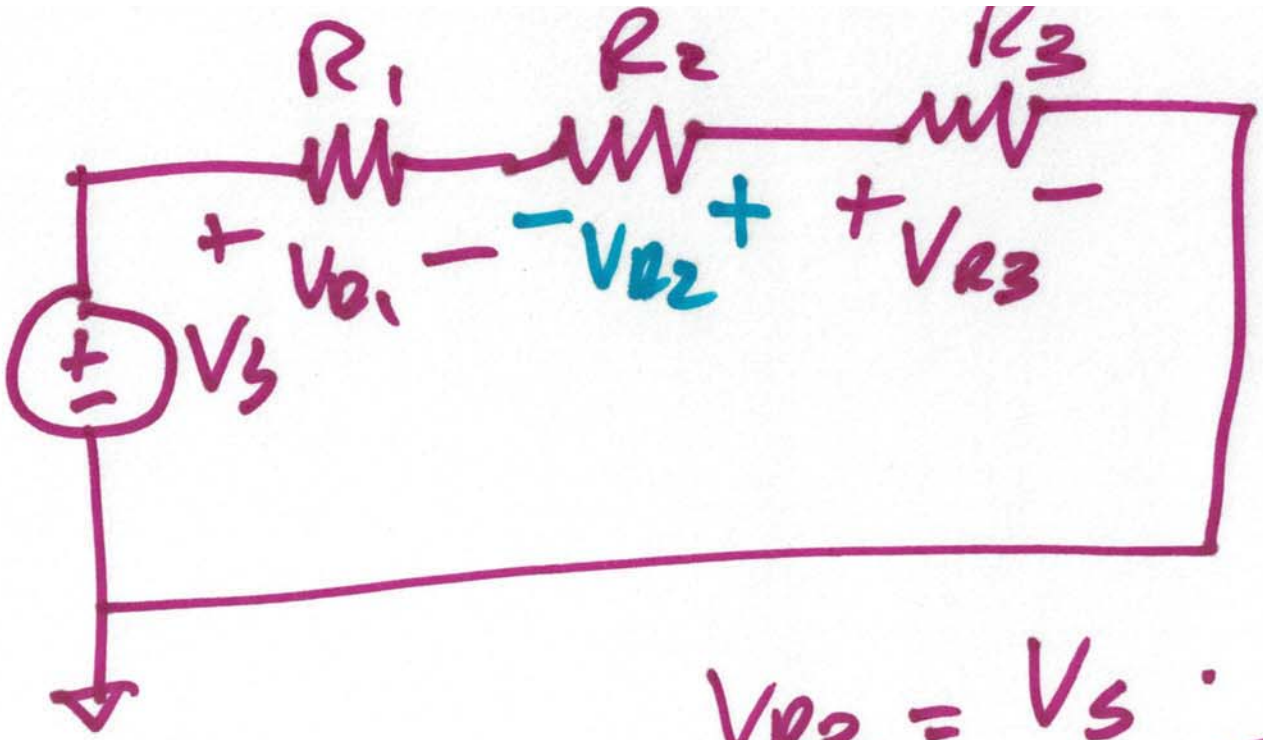
$$V_{R2} = I \cdot R_2$$





$$V_{R2} = V_s \cdot \frac{R_2}{R_1 + R_2}$$

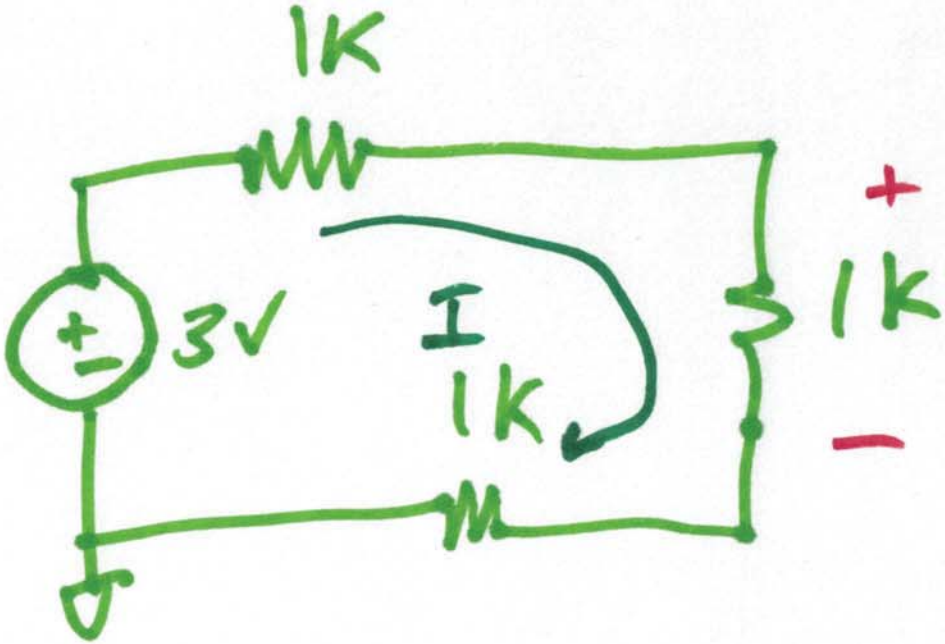
$$V_{R1} = V_s \cdot \frac{R_1}{R_1 + R_2}$$



$$V_{R3} = V_S \cdot \frac{R_3}{R_1 + R_2 + R_3}$$

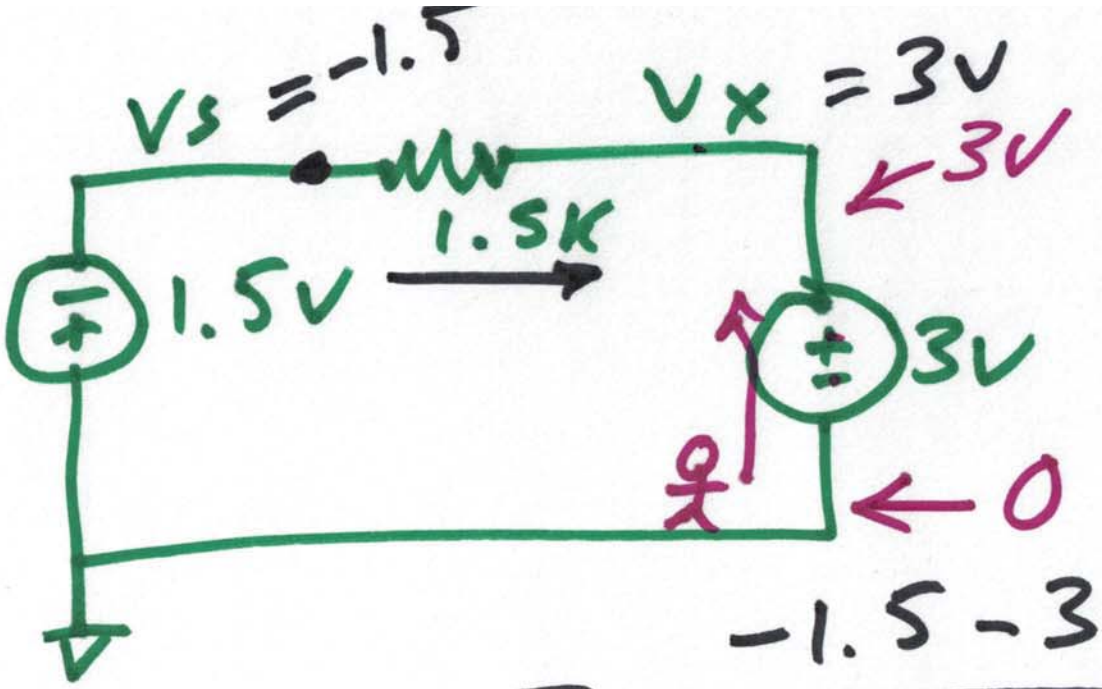
$$V_{R2} = \frac{-V_S \cdot R_2}{R_1 + R_2 + R_3}$$

$$V_{R1} = V_S \cdot \frac{R_1}{R_1 + R_2 + R_3}$$



$$3 \cdot \frac{1K}{1K+1K+1K} = \frac{3K}{3K} = 1V$$

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



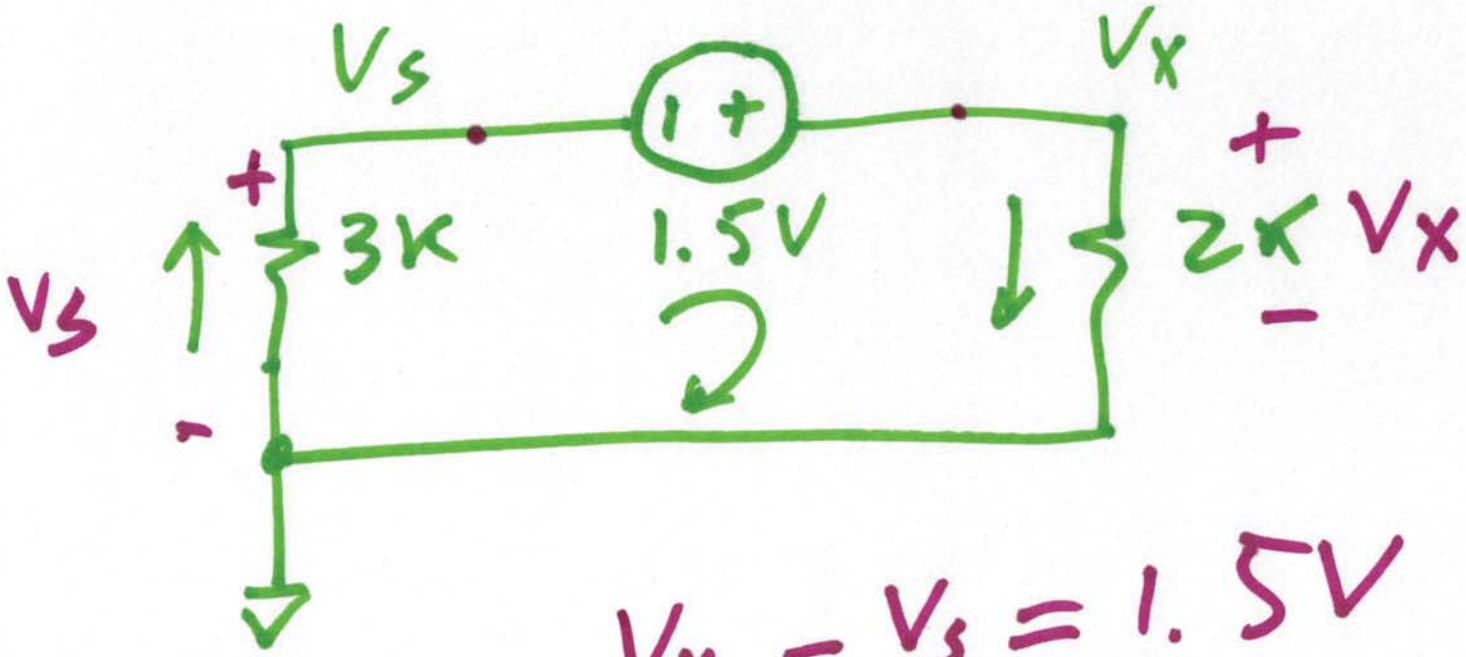
(c)

$$I = \frac{-1.5-3}{1.5K} = \frac{-4.5}{1.5K}$$

$$= -3mA$$

$V = I \cdot R$ (+ V −)

I



$$V_x - V_s = 1.5V$$

$$V_s = -I \cdot 3k$$

$$V_x = I \cdot 2k$$

$$I \cdot 2k + I \cdot 3k = 1.5V$$

$$I = \frac{1.5}{5k} = 0.3mA = 300\mu A$$