

EE 220

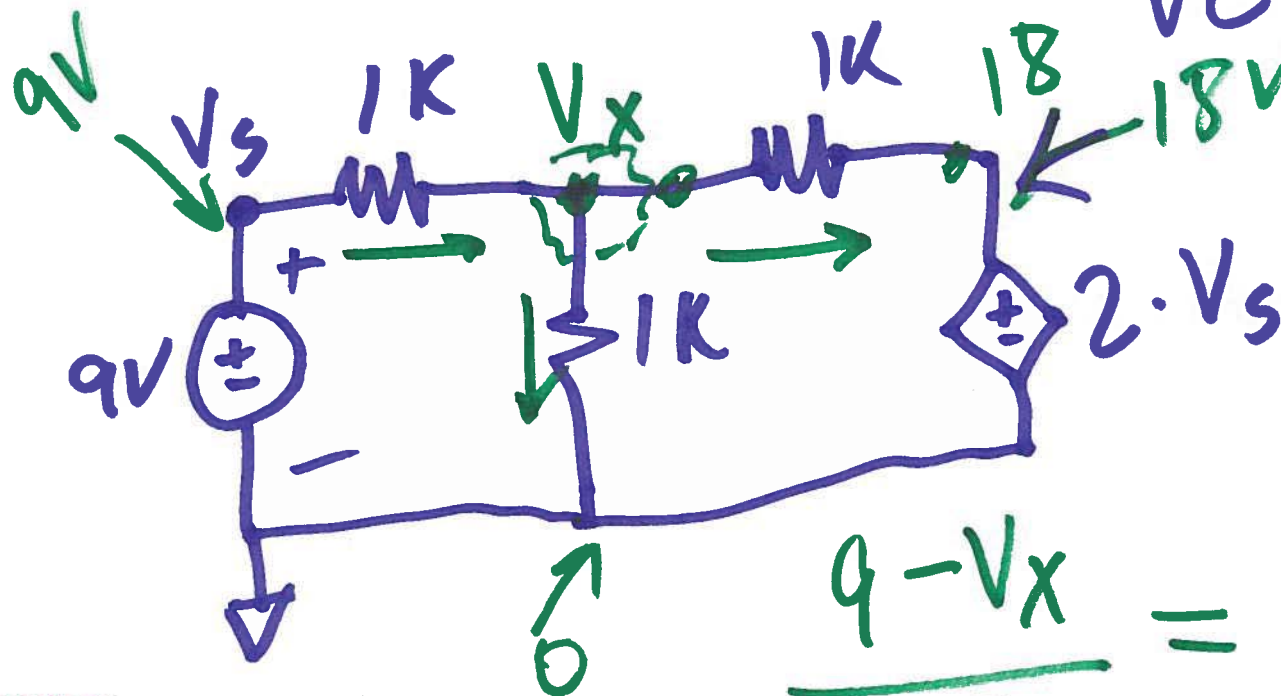
Circuits 1

Lecture 8

$$9 - V_x = 2V_s - 18$$

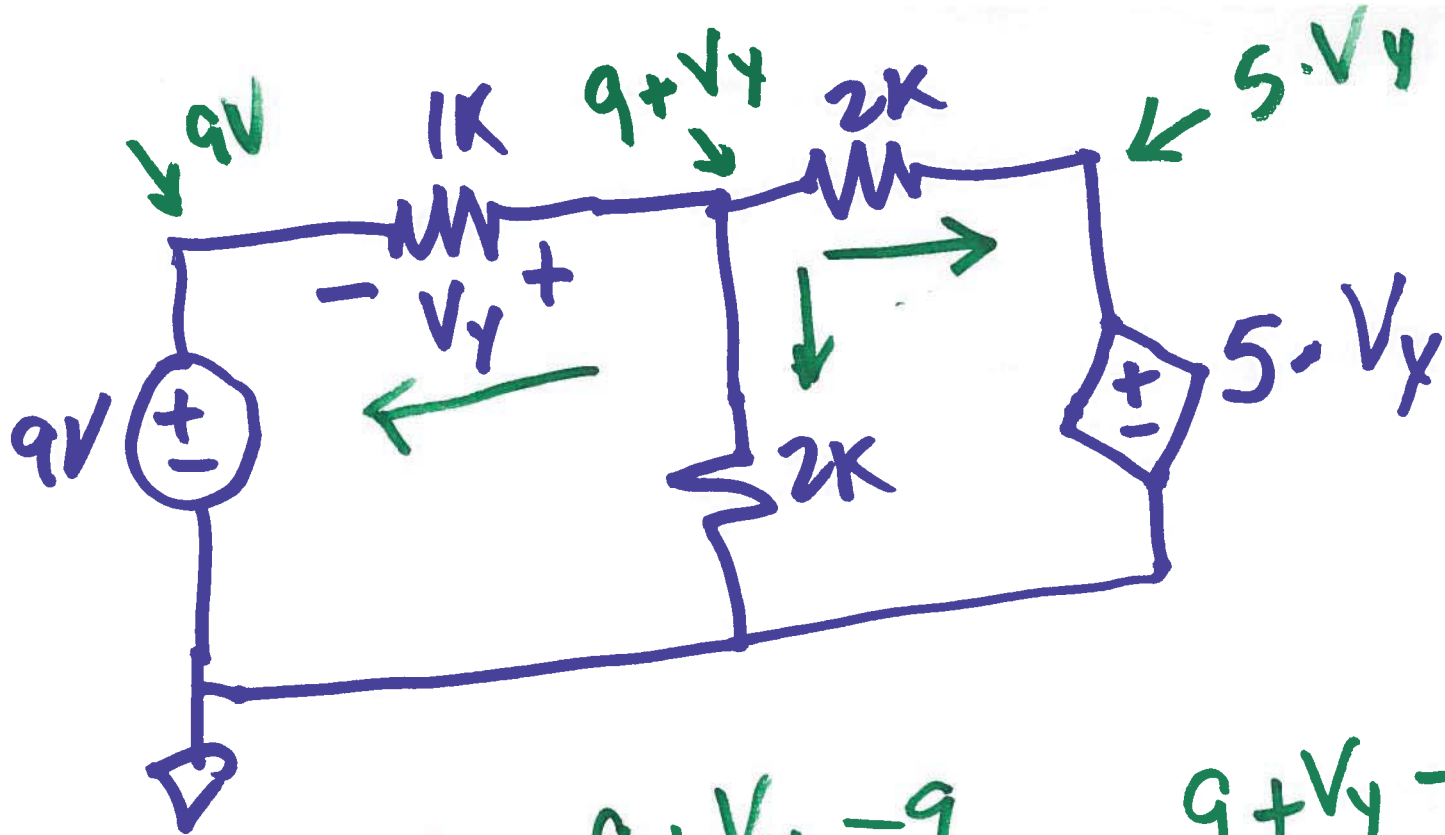
VCVS $27 = 3V_s$

$V_x = 9V$



$$\frac{9 - V_x}{1k} = \frac{V_x - 0}{1k} + \frac{V_x - 18}{1k}$$

17



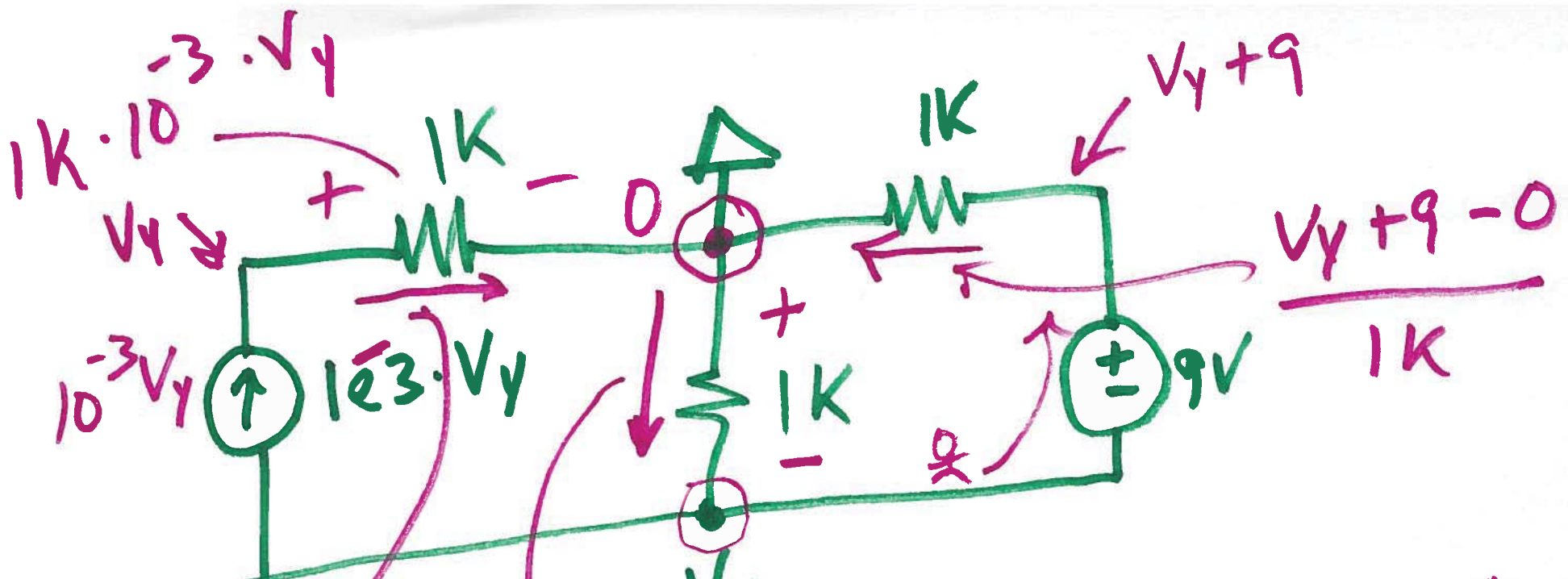
$$\frac{9 + V_y - 5V_y}{2k} + \frac{9 + V_y - 9}{1k} + \frac{9 + V_y - 0}{2k} = 0$$

$$9 + V_y - 5V_y + 18 + 2V_y - 18 + 9 + V_y = 0$$

$$18 - V_y = 0$$

$$\boxed{V_y = 18}$$

27



$$10^{-3} V_y = \frac{0 - V_y}{1k} + \frac{V_y + 9 - 0}{1k}$$

$$10^{-3} V_y = \frac{0 - V_y}{1k} + \frac{V_y + 9}{1k}$$

$$10^{-3} V_y = \frac{-V_y + V_y + 9}{1k}$$

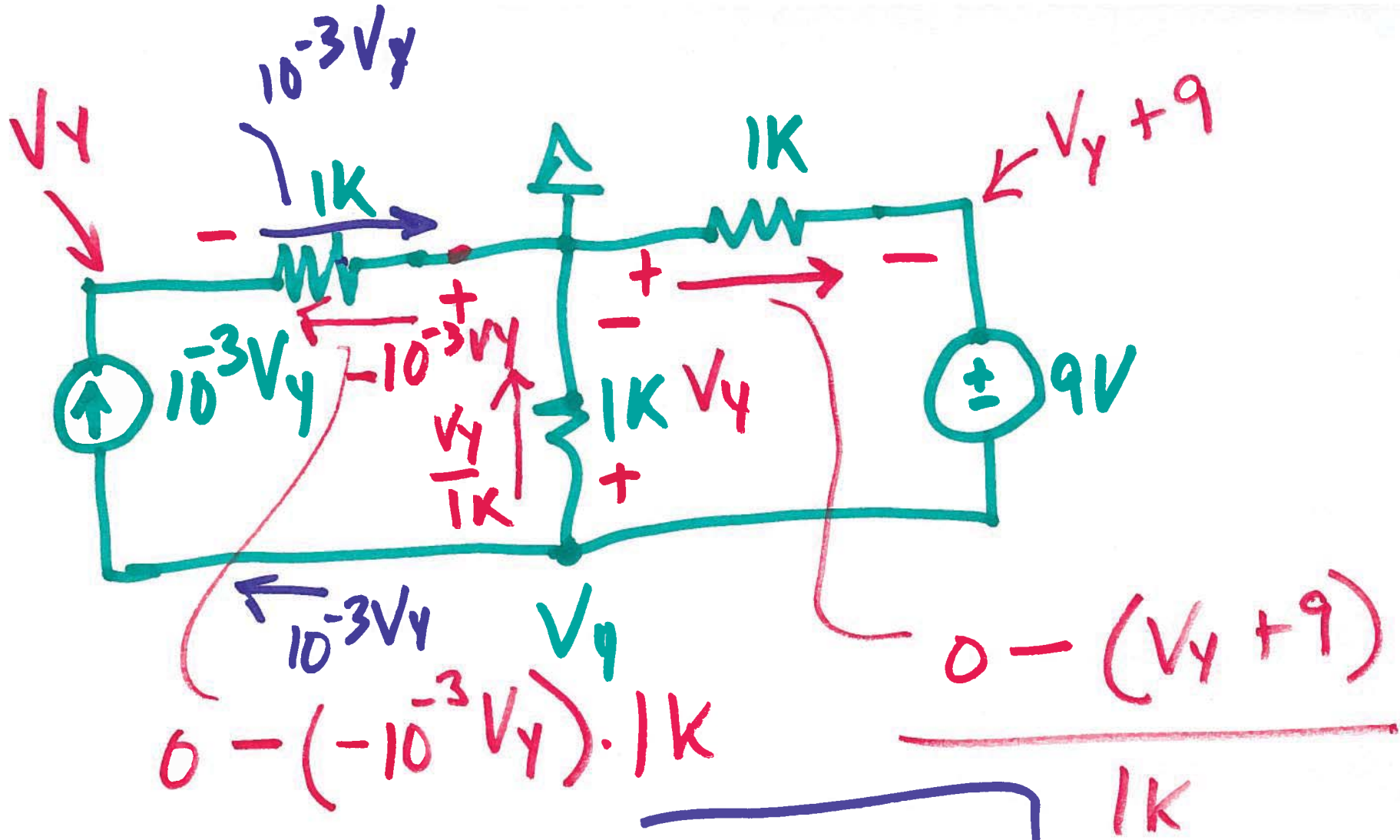
$$10^{-3} V_y = \frac{9}{1k}$$

$$1 \times 10^{-3} = 1m$$

$$2 V_y + 9 = -V_y$$

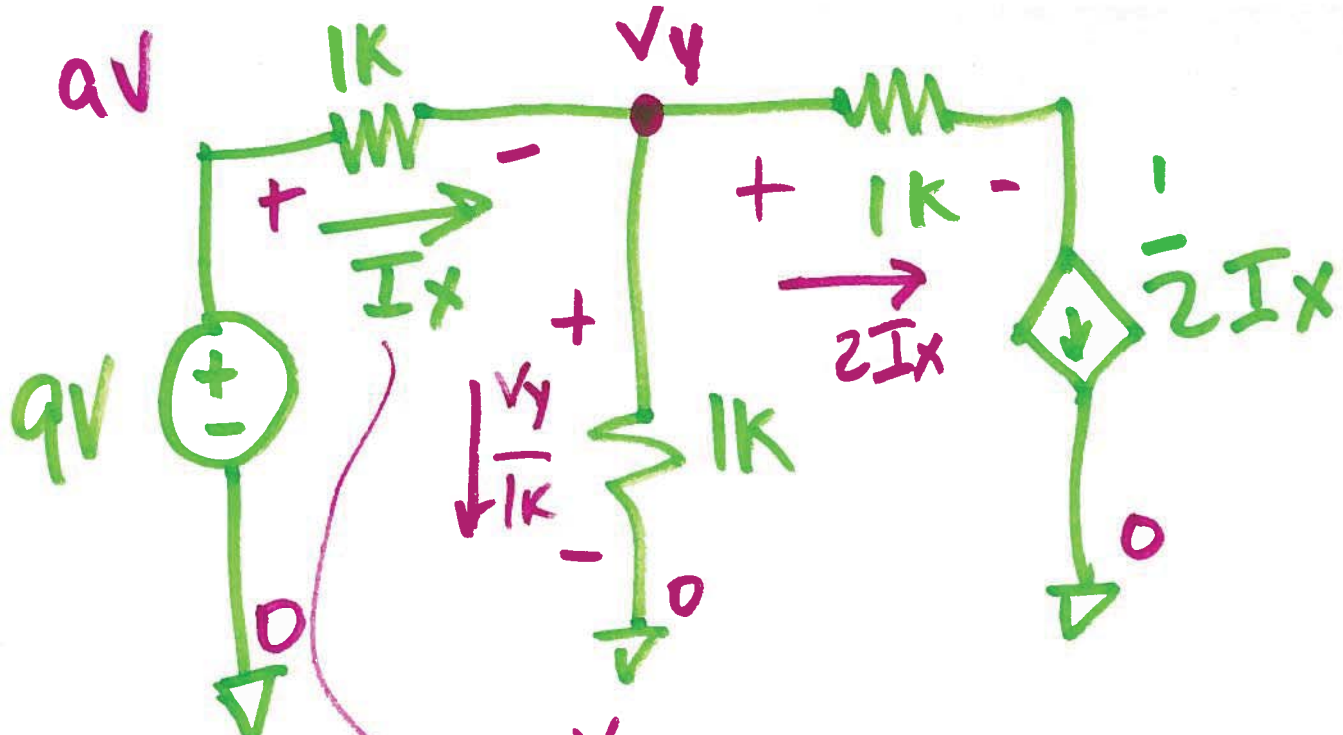
$$V_y = -3$$

3)



$$V_y = -3$$

4)



$$\frac{9 - V_y}{1k} = I_x$$

$$\frac{9 - V_y}{1k} = \frac{V_y}{1k} + \frac{1}{2} \left(\frac{9 - V_y}{1k} \right)$$

$$9 - V_y = V_y + 4.5 - \frac{1}{2} V_y$$

$$4.5 = 1.5 V_y$$

$$V_y = 3V$$

$$9 - V_y = V_y \cdot \frac{1}{2} + 4.5$$

5)