

# ENGR 065: HW 2-3

4- current I

$$+30 - i \times 3 + 10 - 8 - 5 \times i = 0$$

$$8i = 32$$

$$i = 4 \text{ mA}$$

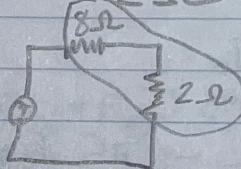
$$V_1 = 3 \cdot i = 4 \cdot 3 = 12 \text{ volts}$$

$$V_2 = 5 \cdot i = 5 \cdot 4 = 20 \text{ volts}$$

$$V_{ab} = V_2 + 8 = 20 + 8 = 28 \text{ volts}$$

5- a)  $R_{eq} = \frac{R_2 \cdot R_3}{R_2 + R_3} = \frac{3 \cdot 6}{3+6} = 18/\Omega = 2 \Omega$

$$\text{series: } 8+2 = 10 \Omega$$



$$V = IR \Rightarrow I = V/R$$

$$I = 30/10 \Rightarrow I = 3 \text{ A}$$

We know KCL: incoming current = outgoing current

$$i_1 = i_2 + i_3$$

$$i_1 = \frac{V_1 - V_0}{8} = \frac{V_1 - 30}{8}$$

$$i_2 = \frac{150 - 30}{8} \Rightarrow 120/8 = 15 \text{ A}$$

$$50 \cdot V_0 = V_2 \cdot i \quad V_0 = V_3$$

$$V_1 = i_1 R_1$$

$$= 15 \cdot 8 = 120 = V_1$$

$$P = VI$$

$$i_2 = 30/3 = 10 \text{ A} \quad i_3 = 30/6 = 5 \text{ A} = 15$$

$$\frac{V_1 - 30}{8} = 15$$

$$V_1 - 30 = 15 \cdot 8$$

$$V_1 = 120 + 30 = 150 \text{ V}$$