

P #14

Ch 18 - pg 579

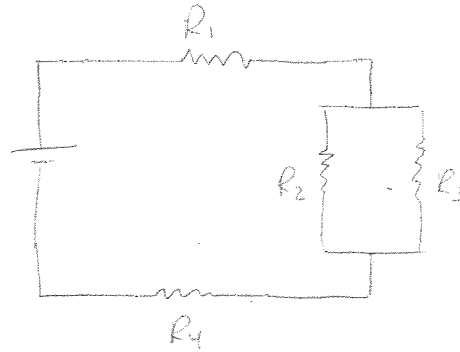
$$R_1 = 2 \Omega$$

$$R_2 = 3 \Omega$$

$$R_3 = 1 \Omega$$

$$R_4 = 4 \Omega$$

$$V_{eq} = 18 V$$



Find R_{23} :
(parallel)

$$\frac{1}{R_{23}} = \frac{1}{R_2} + \frac{1}{R_3}$$

$$R_{23}^{-1} = (3 \Omega)^{-1} + (1 \Omega)^{-1}$$

$$R_{23} = .75 \Omega$$

Find R_{eq} :

$$R_{eq} = R_1 + R_{23} + R_4$$

$$= (2 \Omega) + (.75 \Omega) + (4 \Omega)$$

$$R_{eq} = 6.75 \Omega$$

Find I_{eq} :

$$V_{eq} = I_{eq} \cdot R_{eq}$$

$$(18 V) = I_{eq} \cdot (6.75 \Omega)$$

$$I_{eq} = 2.6 A = I_1 = I_{23} = I_4$$

Find V_1, V_{23}, V_4 :

$$V_1 = I_1 \cdot R_1$$

$$= (2.6 A)(2 \Omega)$$

$$V_{23} = I_{23} \cdot R_{23}$$

$$= (2.6 A)(.75 \Omega)$$

$$V_4 = I_4 \cdot R_4$$

$$= (2.6 A)(4 \Omega)$$

$$V_1 = 5.2 V$$

$$V_{23} = 2 V$$

$$V_4 = 10.4 V$$

Find P_1 and P_4 :

$$P_1 = I_1 \cdot V_1$$

$$= (2.6 A)(5.2 V)$$

$$P_4 = I_4 \cdot V_4$$

$$= (2.6 A)(10.4 V)$$

$$P_1 = 14.2 W$$

$$P_4 = 28.4 W$$