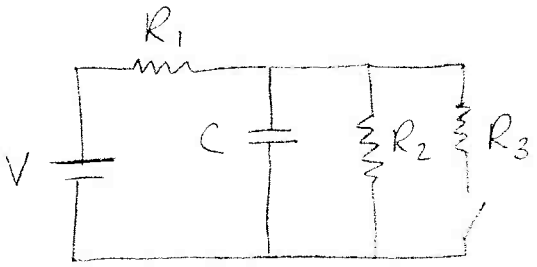
P # H

Ch 18 - Worksheet

$R_1 = R_2 = R_3 = 10\,\Omega$
$C = 140\,\mu F$
$V_{eq} = 12\,V$



a) Find R_{23}: (Parallel)

$$R_{23}^{-1} = R_2^{-1} + R_3^{-1}$$

$$R_{23}^{-1} = (10\,\Omega)^{-1} + (10\,\Omega)^{-1}$$

$$R_{23} = 5\,\Omega$$

Find R_{eq}:

$$R_{eq} = R_1 + R_{23}$$
$$= 10\,\Omega + 5\,\Omega$$
$$R_{eq} = 15\,\Omega$$

Find I_{eq}:

$$V_{eq} = I_{eq} \cdot R_{eq}$$
$$12\,V = I_{eq} \cdot (15\,\Omega)$$

$$I_{eq} = I_{23} = .8\,A$$

Find V_{23}:

$$V_{23} = I_{23} \cdot R_{23}$$
$$= (.8\,A)(5\,\Omega)$$

$$\boxed{V_{23} = 4\,V}$$

b) $V_{23} = 4\,V$
$C = 140\,\mu F$

$$C = \frac{Q}{V}$$

$$140\,\mu F = \frac{Q}{4\,V}$$

$$\boxed{Q = 560\,\mu C}$$