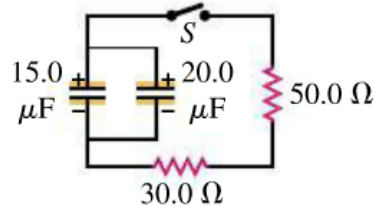


Work Day— work through examples in ch10 trials folder

26.43

26.43 •• CP In the circuit shown in **Fig. E26.43** both capacitors are initially charged to 45.0 V. (a) How long after closing the switch S will the potential across each capacitor be reduced to 10.0 V, and (b) what will be the current at that time?

Figure E26.43



parallel capacitors
series resistors \Rightarrow

$$R_{12} = R_1 + R_2 = 80.0 \Omega$$

$$C_{12} = C_1 + C_2 = 35.0 \mu F$$

$$q(t) = Q e^{-t/RC} \quad \text{and} \quad q(t) = C V(t) \quad \text{so} \quad V(t) = V_0 e^{-t/RC}$$

$$\text{also, } i(t) = \frac{dq(t)}{dt} = \frac{V_0}{R} e^{-t/RC}$$

$$\rightarrow t = -RC \ln V/V_0 = -(80 \Omega)(35.0 \mu F) \ln 10/45 = 4210 \mu S = \underline{4.21 \text{ ms}}$$

$$i(t) = \frac{V_0}{R} e^{-t/RC} = \underline{0.125 \text{ A}}$$