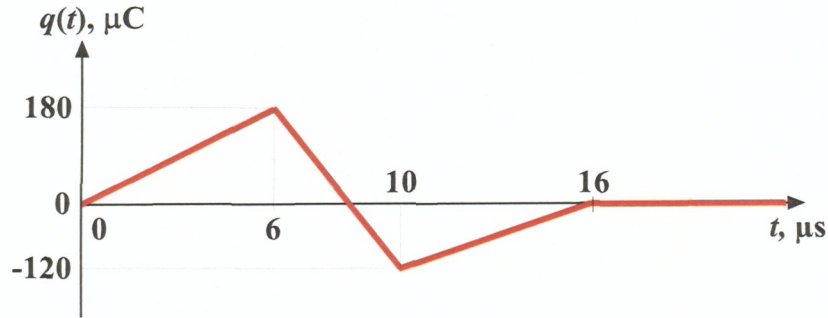


EE 2240
Problem #09

The charge stored in a $12 \mu\text{F}$ capacitor is shown below. Accurately sketch the waveform for the current through the capacitor.



$$i(t) = C \frac{dq}{dt} = C \frac{d}{dt} \left(\frac{q}{C} \right) = \frac{dq}{dt}$$

$$i(t) = \begin{cases} \frac{180 \mu\text{C}}{6 \mu\text{s}} = 30 \text{ A} & : 0 < t < 6 \mu\text{s} \\ \frac{-300 \mu\text{C}}{4 \mu\text{s}} = -75 \text{ A} & : 6 \mu\text{s} < t < 10 \mu\text{s} \\ \frac{120 \mu\text{C}}{6 \mu\text{s}} = 20 \text{ A} & : 10 \mu\text{s} < t < 16 \mu\text{s} \\ 0 & : 16 \mu\text{s} < t \end{cases}$$

