## 1) General Current, Voltage, or Power

The plot below is the net positve charge flowing in a wire vs. time. Sketch the corresponding current during the same period of time.


## 2) Source devices and Total Power


2.3: Determine the power supplied/consumed by each component and show they balance to OW.

## 3) Nodal voltages/voltage drops/currents


3.1: How many nodes are in the above circuit?
3.2: Determine the voltage at every node.
3.3: Determine the current through $\mathrm{R} 3, \mathrm{~V} 2$, and V 3 (label or indicate current direction for full credit)

## 4) $\mathrm{KV} / \mathrm{KCL}$

In this circuit,
4.1: Determine four linearly independent equations for the voltage across the resistors. You will have to use a combination of Ohm's law, KCL, and KVL.

Redraw the circuit with polarities for full credit.

4.2: Set up these equations in matrix/vector form.
4.3: Solve for the voltages across each resistor.

## 5) KVLKCL



In the above circuit,
5.1: Determine five linearly independent equations for the voltage across the resistors. You will have to use a combination of Ohm's Law, KCL, and KVL.
5.2: Set up these equations in matrix/vector form.
5.3: Solve for the currents through each resistor. Use some software like Maple or Matlab or online tools.

Electric Circuits

$$
\begin{aligned}
t & :=0,1 . .6 \\
q(t) & :=\operatorname{if}(t \leq 2,10+10 \cdot t, \text { if }(t \leq 3,-5 t+5, \operatorname{if}(t \leq 4,-5 t+5, \text { if }(t \leq 5,-5 t+5, \text { if }(t \leq 6,5 t, 0)))))
\end{aligned}
$$

