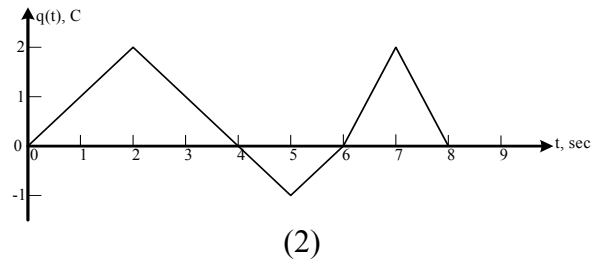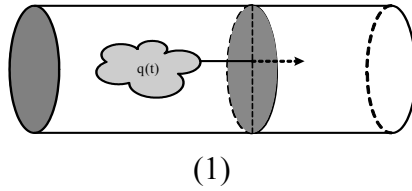1. Drill Exercise 1.2

2. Consider the following diagrams.

(1)   (2)

(a) Determine the charge on a cloud of 7.573×10^{17} electrons.
(b) If this cloud of 7.573×10^{17} electrons move uniformly from the left end of the wire shown in figure 1 to the right end in 1 millisecond (ms), what current flows in the wire? Include a direction in your answer.
(c) How many electrons must pass through the cross-sectional area of figure 1 in 1 minute to produce a current of -10A?
(d) If the charge profile moving through the cross-sectional area of figure 1 is given by $\mathbf{q(t) = t + 0.2e^{-5t} - 0.2}$ C for $t \geq 0$, and $\mathbf{0}$ for $t < 0$, plot the profile (versus time) of the current that flows through the cross-sectional area. What direction does the current flow?
(e) Repeat part (d) for the charge waveform shown in figure 2.