Problem 1.26

A cell phone battery is rated at 3.85 V and can store 10.78 watt-hours of energy.

   (a) How much average current can it deliver over a period of 3 hours if it is fully discharged at the end of that time?

   (b) How much average power is delivered in part (a)?

   (c) What is the ampere-hour rating of the battery?

Solution

Determine the average power supplied by the battery

$$p = 10.78 \text{ Wh} \times \frac{1}{3 \text{ h}} = \frac{539}{150} \text{ W} \approx 3.593 \text{ W}$$

and then use the basic definition of power to obtain the average current.

$$p = vi \quad \rightarrow \quad i = \frac{p}{v} = \frac{\frac{539}{150} \text{ W}}{3.85 \text{ V}} \approx 0.933 \text{ A}$$

Divide the number of watt-hours by the voltage to get the ampere-hour rating of the battery.

$$\frac{10.78 \text{ watt-hours}}{3.85 \text{ V}} = 2.80 \text{ ampere-hours}$$