

Problem 1.24

A utility company charges 8.2 cents/kWh. If a consumer operates a 60-W light bulb continuously for one day, how much is the consumer charged?

Solution

Multiply the power by the amount of time the bulb is on to get the amount of energy used.

$$W = pt = \left(60 \cancel{\text{W}} \times \frac{1 \text{ kW}}{1000 \cancel{\text{W}}} \right) \left(1 \cancel{\text{ day}} \times \frac{24 \text{ h}}{1 \cancel{\text{ day}}} \right) = 1.44 \text{ kWh}$$

Therefore, the cost of operation is

$$1.44 \cancel{\text{ kWh}} \times \frac{\$0.082}{1 \cancel{\text{ kWh}}} \approx \$0.12.$$