Problem 1.25

A 1.2-kW toaster takes roughly 4 minutes to heat four slices of bread. Find the cost of operating the toaster twice per day for 2 weeks (14 days). Assume energy costs 9 cents/kWh.

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Solution

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

$$W = pt = (1.2 \text{ kW}) \left(4 \, \cancel{\text{min}} \times \frac{1 \text{ h}}{60 \, \cancel{\text{min}}} \right) = 0.08 \text{ kWh}$$

After 28 uses, the energy is $28W = 2.24$ kWh. Therefore, the cost of operation is

$$2.24 \, \cancel{\text{kWh}} \times \frac{\$0.09}{1 \, \cancel{\text{kWh}}} \approx \$0.20.$$

This answer is in disagreement with the one at the back of the book.