If electricity costs $0.05 for 1 kW h, how much will it cost to have a radio on for 20 h if the radio is connected to a 120 V outlet and its resistance is 144 $\Omega$?

\[
1 \text{ kwh} = 1 \times 10^3 \frac{J}{s} \left(3600 \text{ s}\right) = 3.6 \times 10^6 \text{ J}
\]

Radio Power
\[
P = \frac{V^2}{R} = \frac{(120)^2}{144} = 100 \text{ W}
\]

Radio Energy
\[
\text{Energy} = \text{power} \times \text{time}
\]
\[
= 100 \text{ W} \times 20 \text{ hr}
\]
\[
= 100 \frac{J}{s} \times 20 \text{ hr} \times \frac{3600 \text{ s}}{\text{hr}}
\]
\[
= 7.2 \times 10^6 \text{ J}
\]

Cost
\[
\frac{7.2 \times 10^6 \text{ J}}{3.6 \times 10^6 \frac{\text{J}}{s}}
\]
\[
= 10 \text{ \$}
\]