**1–3C** An office worker claims that a cup of col his table warmed up to 80°C by picking up ener surrounding air, which is at 25°C. Is there any claim? Does this process violate any thermodynam

$T_{air} = 25°C \rightarrow \quad T_c = 80°C$

* No, $T_c = 25°C$
* Not Violate

**1–15** A 4-kW resistance heater in a water he 3 hours to raise the water temperature to the Determine the amount of electric energy used and kJ.

3 hours. $P = 4\,kW$ $t = 3\,h$

$E\,(kWh) = P\,t = 4 * 3 = 12\,kWh$

**1–19C** A large fraction of the thermal energy g
the engine of a car is rejected to the air by the radia
the circulating water. Should the radiator be ana
closed system or as an open system? Explain.

**FIGURE P1–19C**

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openSystem.

↳ mass flow in and out of the System and across Boundary

**1–47** A vacuum gage connected to a chamber re at a location where the atmospheric pressure is 92 mine the absolute pressure in the chamber.

$P_{vac} = 35\,kPa$

$P_{atm} = 92\,kPa$ $\quad P_{abs} = ?$

$P_{vac} = P_{atm} - P_{abs}$

$35 = 92 - P_{abs} \quad P_{abs} = 92 - 35 = 5$

**1–51E** A 200-pound man has a total foot in $72\ in^2$. Determine the pressure this man exerts or (*a*) he stands on both feet and (*b*) he stands on or

$m = 200\,lbm$ $\quad A_f = 72\ in^2$

$P = \frac{W}{A} = \frac{mg}{A}$

$g = 32.17\ ft/s^2$

$1\,ft = 12\,in \Rightarrow 1\,in = \frac{1}{12}\,ft$

$1\,in^2 = \left(\frac{1}{12}\right)^2 ft^2$

$W = mg = 200 * 32.174 = 6434.8$ lbs

a) $P = \frac{W}{A_f} = \frac{6434.8}{0.5} = 12869.6$ lbf / ft$^2$

b) $P = \frac{W}{A_f} = \frac{6434.8}{0.25} = 25739.2$ lbf / ft$^2$