8   An electric heater has a constant resistance and is rated as 1.20 kW, 230 V.

The heater is connected to a 230 V supply by means of a cable that is 9.20 m long, as illustrated in Fig. 8.1.
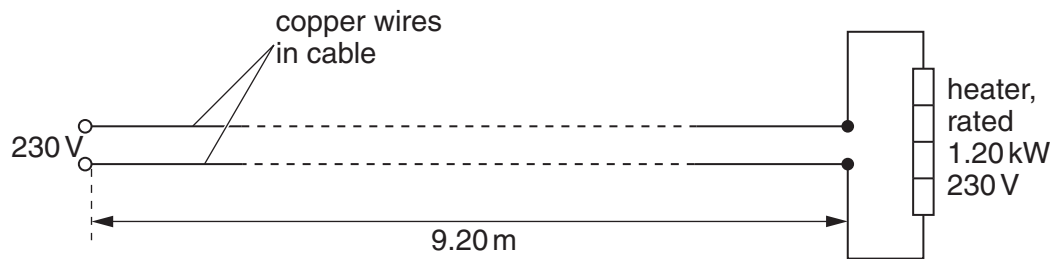

Fig. 8.1

The two copper wires that make up the cable each have a circular cross-section of diameter 0.900 mm. The resistivity of copper is $1.70 \times 10^{-8}\,\Omega\,m$.

(a) Show that

   (i) the resistance of the heater is 44.1 Ω,

[2]

   (ii) the total resistance of the cable is 0.492 Ω.

[2]

(b) The current in the cable and heater is switched on. Determine, to three significant figures, the power dissipated in the heater.

power = ... W [3]

(c) Suggest two disadvantages of connecting the heater to the 230 V supply using a cable consisting of two thinner copper wires.

1. ....

....

2. ....

....

[2]

Please turn over for Question 9.