Solutions

Each answer shows the steps, then the **result**.

2.1

- live, neutral and earth

2.2

- water lets current pass into a person, increasing the risk of an electric shock

2.3

- live: brown
- earth: green and yellow stripes

2.4

- a person could touch the exposed live wire and get an electric shock (or the bare wires could touch, causing a short circuit and a fire)

3.1 C

- the fuse (and switch) must be in the live wire

3.2

(a) the 10 A fuse

- it is just above the normal working current of 8 A, so it carries normal current but blows on a fault

(b) if the current gets too large, the thin fuse wire melts and breaks the circuit before the cable overheats

3.3

- if a live wire touches the metal case, the earth wire provides a low-resistance path to the ground
- a large current flows to earth
- this blows the fuse, cutting off the supply so the case cannot give a shock

3.4

(a) $P = IV$, so $I = P/V$

$$I = \frac{P}{V} = \frac{2300\ \text{W}}{230\ \text{V}} = \mathbf{10}\ \text{A}$$

(b) the **13** A fuse

- it is the lowest rating above the normal current of 10 A: the 3 A and 5 A fuses would melt in normal use

3.5

- when the fuse melts, it must disconnect the appliance from the high potential of the live wire
- a fuse in the neutral wire would melt, but the appliance would still be connected to the live wire, so touching it could still give a shock