Electrical Power and Mains Electricity

Electricity · 4 questions · step-by-step answers at the end

Name: Date: Score: / 4

USEFUL EQUATIONS

$P = IV$ $P = I^2R$ $E = Pt$ $E = QV$

Questions

Show your working in the space under each question.

1. A 60 W lamp is on for 5 hours. How many kWh does it use?

2. A 2300 W kettle works on 230 V. Find its current, a suitable fuse (3 A, 5 A or 13 A), and the energy it uses in 3.0 minutes in joules and in kWh.

3. Choose a fuse (3 A, 5 A or 13 A) for a 3 kW heater on 230 V.

4. A 2 kW heater runs for 3 hours. Electricity costs 0.30 per kWh. Find the cost.

Step-by-step answers

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1. 0.060 kW × 5 h = **0.30 kWh**.

2. 1. I = P/V = 2300/230 = **10 A**, so use the **13 A** fuse.
2. E = Pt = 2300 × 180 = **414 000 J**.
3. In kWh: 2.3 kW × 0.050 h = **0.115 kWh**.
Answer: 10 A; 13 A fuse; 414 kJ = 0.115 kWh

3. I = 3000/230 = 13.0 A, so the **13 A** fuse.

4. 2 × 3 = 6 kWh; 6 × 0.30 = **1.80**.