

Power and Heating Calculation Questions Using $P = I^2R$

These questions are based on real electrical devices where resistance causes heating. Show all working and give units in your answers.

1. A heated phone holder draws a current of 1.5 A through a resistance of 4 Ω . Calculate the power transferred.
2. An electric blanket has a resistance of 12 Ω and a current of 2 A flowing through it. Calculate the power transferred.
3. A toaster draws a current of 6 A through a heating element with a resistance of 8 Ω . Calculate the power transferred.
4. An air fryer heating element has a resistance of 15 Ω and carries a current of 8 A. Calculate the power transferred.
5. A hairdryer draws a current of 10 A through a resistance of 20 Ω . Calculate the power transferred.
6. An electric shower transfers 4840 W of power through a heating element with a resistance of 30.25 Ω . Calculate the current flowing through the element.
7. A greenhouse heater transfers 1250 W of power and draws a current of 5 A. Calculate the resistance of the heating element.
8. An immersion heater transfers 3600 W of power through a resistance of 25 Ω . Calculate the current flowing through the heater.
9. A storage heater draws a current of 12 A through a resistance of 18 Ω . Calculate the power transferred. If the current doubled, what would the new power be?
10. An industrial oven transfers 28800 W of power while drawing a current of 40 A. Calculate the resistance of the heating element. Explain why a large current leads to significant heating.