1. Write down the equation that links power, energy and time?

Power = energy transferred / time taken   (P = E / t   or   E = P t   or   t = E / P)

2. What is the unit of power?

Watt   (W)

3. A device has a power of 60 W. What does this tell you about the energy it transfers each second?

60 joules of energy are transferred each second

4. Write down the equation that links power, current and voltage.

P = I V   (or   I = P / V   or   V = P / I)

5. Write down the equation that links power, current and resistance.

P = I² R   (or   I² = P / R   or   R = P / I²)

6. A lamp has a voltage of 12 V across it and a current of 3 A flowing through it. Calculate its power.

$P = I\,V$ $= 3 \times 12$ $= 36\ W$

7. A 230 V kettle draws a current of 10 A. Calculate its power.

$P = I\,V$ $= 10 \times 230$ $= 2300\ W$ (or 2.3kW)

8. A motor has a power of 180 W and is supplied with 12 V. Calculate the current.

$I = P\,/\,V$ $= 180\,/\,12$ $= 15\ A$

9. A lamp transfers 24 W of power when a current of 2 A flows through it. Calculate the voltage.

$V = P\,/\,I$ $= 24\,/\,2$ $= 12\ V$

10. A resistor has a current of 2 A flowing through it and a resistance of 5 Ω. Calculate the power dissipated.

$P = I^2\,R$ $= 2^2 \times 5$ $= 4 \times 5$ $= 20\ W$

11. A heater has a resistance of 25 Ω and a current of 4 A flowing through it. Calculate its power.

$P = I^2 R$ $= 4^2 \times 25$ $= 16 \times 25$ **= 400 W**

12. A resistor dissipates 100 W of power when a current of 5 A flows through it. Calculate its resistance.

$R = P / I^2$ $= 100 / 5^2$ $= 100 / 25$ **= 4 Ω**

13. A lamp has a power of 36 W and a current of 3 A flowing through it. Calculate its resistance.

$R = P / I^2$ $= 36 / 3^2$ $= 36 / 9$ **= 4 Ω**

14. A 24 V motor draws 6 A.
a) Calculate its power.   **b)** How much energy does it transfer in 30 seconds?

a) $P = I V$ $= 6 \times 24$ **= 144 W**

b) $E = P t$ $= 144 \times 30$ = **4320 J** *(or 4.32 kJ)*

15. A component draws 4 A when connected to a 24 V supply. How much energy does it transfer in 5 seconds?

$P = I V$ $= 4 \times 24$ **= 96W**

$E = P t$ $= 96 \times 5$ **= 480 W**