

Week 2 Homework answers

1. List the 7 base SI quantities and their unit

Base Quantity	SI Unit & Abbreviation
Length	metre, m
Time	second, s
Mass	kilogram, kg
Temperature	kelvin, K
Electric current	ampere, A
Amount of substance	mole, mol
Luminous Intensity	candela, cd

2. A cuboid has dimensions 3 cm x 6 cm x 12 cm, what is its volume in SI units? Give your answer in standard form.

$$0.03 \times 0.06 \times 0.12 = 2.16 \times 10^{-4} \text{ m}^3$$

3. How long is 14 days in SI units? Give your answer in standard form.

$$14 \times 24 \times 60 \times 60 = 1.21 \times 10^6 \text{ s}$$

4. A potential difference of 2 kV is applied across a wire with a resistance of 5 MΩ. Give your answer in mA.

$$(2 \times 10^3)/(5 \times 10^6) = 4 \times 10^{-4} = 0.4\text{mA}$$

5. **Force = Mass x Acceleration**

Derive the base units of Force

$$\text{kgms}^{-2}$$

6. **Work done = Force x Distance**

Derive the base units of Work done

$$\text{kgm}^2\text{s}^{-2}$$

7. **Power = Work done / Time**

Derive the base units of Power

$$\text{kgm}^2\text{s}^{-3}$$

Very difficult

8. **Voltage = Work done / Charge**

Derive the base units of Voltage

$$\text{kgm}^2\text{s}^{-3}\text{A}^{-1}$$