



QUESTION WORKBOOK

Modelling, quantities and units

Mechanics · Year 12–13

7 questions · 20 marks

PRINT EDITION

SECTION A · Warm-up

- A1** A car is modelled as a particle. State what the model assumes, and one consequence for the mathematics. [2]

- A2** A load hangs from a crane by a cable modelled as a light inextensible string. State what each modelling word contributes. [2]

SECTION B · Standard

- B1** Explain the modelling words smooth, rough and uniform. [3]

- B2** Write the SI units of velocity, acceleration and force, and show that the equation $s = ut + \frac{1}{2}at^2$ is consistent in units. [3]

- B3** Sort into scalars and vectors: mass, weight, speed, velocity, distance, displacement. [3]

SECTION C · Stretch

- C1** A stone and a feather are dropped together and a student's model predicts they land together. Identify the modelling assumption responsible, and discuss for which object it is reasonable. [4]

- C2** Explain why models still keep their place despite such failures, and what a modeller does when predictions disagree with experiment. [3]
