

1.2 Forces and movement

Name: _____ Class: _____ Date: _____

Total: 23 marks

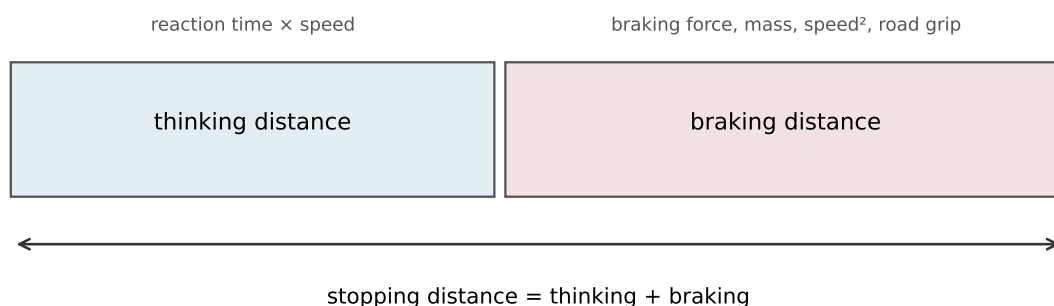
Objective

Cover forces and movement (1.11–1.24): scalars and vectors, resultant force, $F = ma$, weight, stopping distances, terminal velocity and Hooke's law. Original IGCSE-level practice.

1 Key knowledge and worked examples

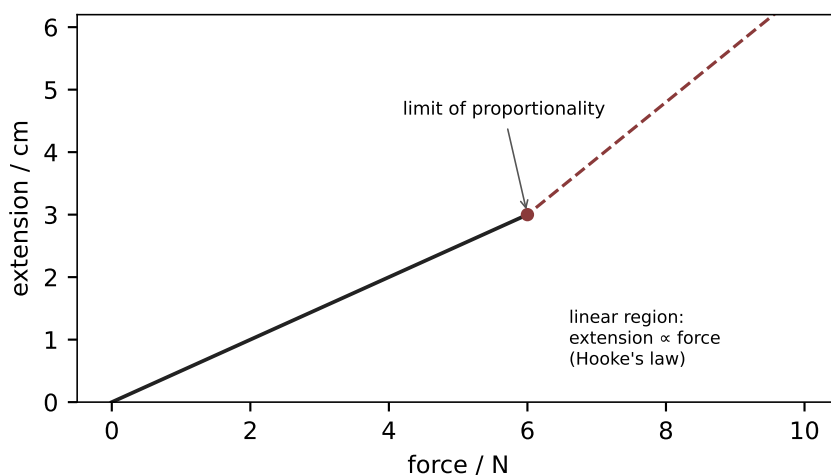
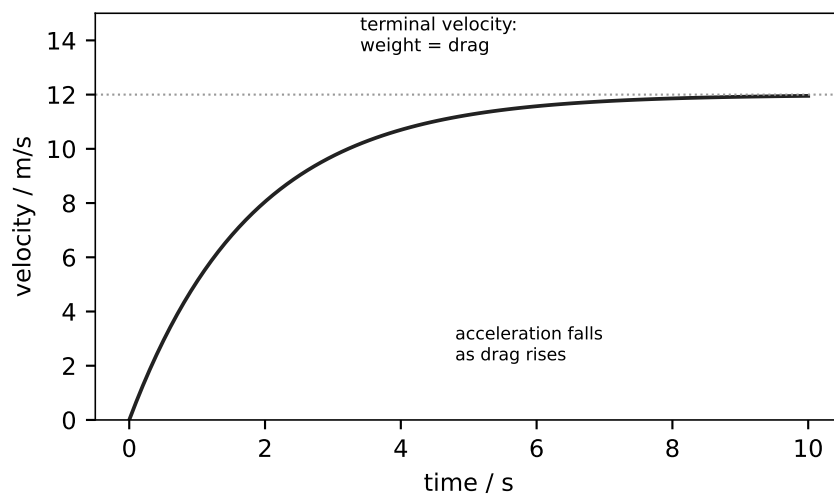
■ Resultant force first

Add forces along a line: 8 N forward and 3 N back give a resultant of 5 N forward. Friction always opposes motion. Only an **unbalanced** force accelerates: $F = ma$, and weight $W = mg$ (g in N/kg).



Thinking grows with speed × reaction time; **braking** grows with speed², mass, poor brakes and poor road grip.

■ Terminal velocity and Hooke's law



2 Practice

2.1 State the difference between a vector and a scalar, giving one example of each. [2]

2.2 A 1500 kg car has a driving force of 4500 N and total drag of 1500 N. Calculate its acceleration. [3]

2.3 Calculate the weight of a 65 kg person at $g = 10 \text{ N/kg}$. [2]

2.4 State two factors that increase the braking distance. [2]

2.5 State Hooke's law and where it stops applying. [2]

3 Exam-style questions

3.1 Explain, naming the forces at each stage, why a parachutist who jumps from a plane reaches a terminal velocity before opening the parachute, and again (lower) after opening it. [5]

3.2 A trolley of mass 2 kg is pulled with 8 N along a surface with friction 2 N. Calculate the acceleration, and the new acceleration if friction doubles. [4]

3.3 Explain why speed cameras and longer following distances matter when roads are wet, referring to stopping distance. [3]
