

EXAM-DAY · 90-MIN REVISION CARD

Motion in a Straight Line

Print this · Fold it · Carry to the exam-hall gate · Revise once · Then walk in.

FORMULAS & KEY RESULTS

Displacement: $\Delta x = x_{\text{final}} - x_{\text{initial}}$ (signed, vector in 1D).

Distance: total path length (scalar, always positive).

Average velocity: $v_{\text{avg}} = \Delta x / \Delta t$.

Average speed: $s_{\text{avg}} = \text{total distance} / \Delta t$.

Instantaneous velocity: $v = dx/dt = \text{slope of } x\text{-}t \text{ graph}$.

Average acceleration: $a_{\text{avg}} = \Delta v / \Delta t$.

Instantaneous acceleration: $a = dv/dt = d^2x/dt^2$.

Kinematic Eq 1: $v = u + at$

Kinematic Eq 2: $s = ut + (1/2)at^2$

Kinematic Eq 3: $v^2 = u^2 + 2as$

Distance in n th second: $s_n = u + (a/2)(2n - 1)$

Free fall (downward positive): $a = g = 9.8 \text{ m/s}^2$; if thrown up, set $a = -g$.

Relative velocity in 1D: $v_{AB} = v_A - v_B$ (with signs).

Slope $x\text{-}t$ graph = velocity; Slope $v\text{-}t$ graph = acceleration.

Area under $v\text{-}t$ graph = displacement (signed).

TOP 5 PYQ PATTERNS

1 Free-fall numerical (3 marks)

3 marks · 92% of years

Sign convention first. Then pick the equation that has the 3 known quantities of the 4 (u, v, a, s, t).

2 Distance vs displacement (2 marks)

2 marks · 85% of years

Draw number line, label A/B/C with positions, then compute both separately.

3 Graph reading (2 marks)

2 marks · 78% of years

Slope or area — never both. Pick which the question asks for.

4 Average velocity multi-stage (3 marks)

3 marks · 70% of years

Total displacement / total time. NEVER simple average of speeds.

5 n th-second distance (2 marks)

2 marks · 55% of years

Apply $s_n = u + (a/2)(2n-1)$ directly. ($2n - 1$), not ($2n + 1$).

90-MIN REVISION FLOW

0-15 min

Read definitions: position, distance, displacement, speed, velocity, acceleration. Write each in your own words.

15-35 min

Derive $v = u + at$ and $s = ut + (1/2)at^2$ from a $v\text{-}t$ graph. Practice on a blank sheet without notes.

35-55 min

Solve 3 free-fall numericals: dropped from height H , thrown up with u , thrown down from H .

55-70 min

Solve 2 graph-reading problems: extract velocity from $x\text{-}t$, displacement from area under $v\text{-}t$.

70-85 min

Quick PYQ block: 4 MCQs from this chapter (timed, 1 min each) + 1 distance-vs-displacement word problem.

85-90 min

Review your topper-template page (5 question types, 3 marks each). Memorise the step structure, not the numbers.

Confidence, not anxiety. You've practised this all year. Trust your steps. Don't change strategy on exam morning.
Helpline: **+91 70330 05444 · readyforboards.com**