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Motion in One Dimension

Understanding Motion in One Dimension Simplifies Physics Concepts.

DEFINITION

> Motion in one dimension refers to the movement of an object along a straight line. It involves analyzing how position changes over time.

KEY CONCEPTS

Distance

Distance is the total path length traveled by an object, regardless of direction.

Displacement

Displacement is the shortest distance from the initial to the final position, including direction.

Speed

Speed is the rate at which an object covers distance, calculated as distance divided by time.

Velocity

Velocity is the rate of change of displacement, incorporating both speed and direction.

Acceleration

Acceleration is the rate of change of velocity over time, indicating how quickly an object speeds up or slows down.

EXAMPLES

→ A car travels 100 km east in 2 hours.

→ A runner completes a 400 m lap in 50 seconds.

→ A ball is thrown straight up and comes back down.

MEMORY TIPS

★ Remember 'D' for Distance and 'D' for Direction in Displacement.

★ Use 'S' for Speed and 'V' for Velocity to differentiate between them.

★ Think of 'A' in Acceleration as 'A' for 'Action' to remember it changes velocity.

COMMON MISTAKES

✗ Confusing distance with displacement by ignoring direction.

✗ Calculating speed without considering the correct time interval.

✗ Assuming constant velocity when acceleration is present.

QUICK RECAP

Motion in one dimension involves distance, displacement, speed, velocity, and acceleration. Understanding these concepts helps analyze how objects move along a straight path.