Know methods for one-, two- and three-dimensional kinematics

Key knowledge | Free preview

Learning target: Know methods for one-, two- and three-dimensional kinematics.

Position, velocity and acceleration have different meanings and signs. Distance requires separating intervals where velocity changes sign, while displacement comes from the endpoints. To use $a=v\cdot dv/dx$, velocity must be treated locally as a function of position; solving for v^2 alone leaves the direction unresolved.

Try the mathematics

Task 1. A particle has $x(t)=t^2-4t+1$ metres for $0\leq t\leq 5$ seconds. Find v,a, its turning time, displacement and total distance. State when speed decreases and increases.

Continue with the full worksheet

The complete resource has 2 focused task sets and substantive worked solutions. Use an exercise book or print the A4 worksheet. This preview shows the first task without its full solution.

Find this resource: https://resources.aspiretopowerlearning.com.au/vce/skills/sm-u34-o1-kk-12/

Study-design reference

VCE Mathematics Study Design 2023-2027, version 1.1 (November 2022). Specialist Mathematics; Units 3–4; Outcome 1; Key knowledge; bullet 12; p. 114.

The learning target is a concise paraphrase. Aspire reference: sm-u34-o1-kk-12. This is an internal identifier, not an official VCAA code.

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