Apply vectors to particle motion and geometric problems

Key skills | Free preview

Learning target: Apply vectors to particle motion and geometric problems.

Differentiate or integrate a vector function component by component, retaining vector initial conditions. The speed is the magnitude of velocity, not the magnitude of displacement divided by elapsed time. A path intersection concerns possibly different parameter values; a collision requires both particles to be at that point at the same time.

Try the mathematics

Task 1. For $r(t)=(t,t^2,t^3)$, find $v(t)$,$a(t)$ and the speed at $t=1$. Conversely integrate $v(t)=(1,2t,3t^2)$ with $r(0)=(2,-1,4)$.

Continue with the full worksheet

The complete resource has 3 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-ks-11/

Study-design reference

VCE Mathematics Study Design 2023-2027, version 1.1 (November 2022). Specialist Mathematics; Units 3–4; Outcome 1; Key skills; bullet 11; p. 115.

The learning target is a concise paraphrase. Aspire reference: sm-u34-o1-ks-11. This is an internal identifier, not an official VCAA code.

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