Know common vector applications to particle motion and geometry

Key knowledge | Free preview

Learning target: Know common vector applications to particle motion and geometry.

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-kk-11/

Study-design reference

VCE Mathematics Study Design 2023-2027, version 1.1 (November 2022). Specialist Mathematics; Units 3–4; Outcome 1; Key knowledge; bullet 11; p. 114.

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

Free preview: share intact with attribution, without charging. Full resource rights are not included.

Original independent practice. Not published or endorsed by VCAA. The activity is not an official SAC, examination or complete treatment of every clause of a broad curriculum requirement.