Continuity and differentiability at a join

Key knowledge | Free preview

Learning target: Understand the informal meanings of a limit, continuity and differentiability.

Continuity requires the two-sided limiting value to match the function value. Differentiability is stronger: the slopes approaching from both sides must also agree. A corner can be continuous without being differentiable, and a jump cannot be differentiable. At a piecewise join, test values and slopes as separate conditions rather than combining them automatically.

Try the mathematics

Task 1. Let $f(x)=x^2$ for $x\leq 1$ and $f(x)=2x+c$ for $x>1$. Find c for continuity at $x=1$ and then test differentiability there.

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/aspire-mm-u2-o1-kk-09/

Study-design reference

VCE Mathematics Study Design 2023-2027, version 1.1 (November 2022). Mathematical Methods; Unit 2; Outcome 1; Key knowledge; bullet 9; p. 55.

The learning target is a concise paraphrase. Aspire reference: aspire-mm-u2-o1-kk-09. This is an internal identifier, not an official VCAA code.

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