Bisection and root verification

Key skills | Free preview

Learning target: Find and check roots on an interval using algebra, graphs and numerical methods, including factor-theorem reasoning and bisection.

For a continuous function, opposite endpoint signs guarantee at least one zero in the interval. Bisection repeatedly tests the midpoint and keeps a sign-changing half. It gives a bracket rather than an exact root. The midpoint error is at most half the current bracket width, provided the relevant root remains inside.

Try the mathematics

Task 1. For $f(x)=x^3-5$, start with [1,2]. Perform three bisections by hand, recording each midpoint, its sign and the new bracket.

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-u1-o1-ks-07/

Study-design reference

VCE Mathematics Study Design 2023-2027, version 1.1 (November 2022). Mathematical Methods; Unit 1; Outcome 1; Key skills; bullet 7; p. 47.

The learning target is a concise paraphrase. Aspire reference: aspire-mm-u1-o1-ks-07. This is an internal identifier, not an official VCAA code.

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