Newton iteration for a cubic

Key skills | Free preview

Learning target: Use Newton's iteration to approximate a root of a cubic.

Newton’s method uses a tangent-line root to update an approximation. For a polynomial, calculate the derivative first and ensure it is nonzero at the current iterate. A small change between iterates suggests convergence but should be backed by a residual check. A graph or bracket can help choose a useful starting value.

Try the mathematics

Task 1. For $f(x)=x^3-7$, write the Newton update and take three steps from $x_0=2$. Keep more working digits than the final answer needs.

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-ks-05/

Study-design reference

VCE Mathematics Study Design 2023-2027, version 1.1 (November 2022). Mathematical Methods; Unit 2; Outcome 1; Key skills; bullet 5; p. 55.

The learning target is a concise paraphrase. Aspire reference: aspire-mm-u2-o1-ks-05. This is an internal identifier, not an official VCAA code.

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