Understand complex-number operations, properties, Cartesian/polar forms and complex-plane representations

Key knowledge | Free preview

Learning target: Understand complex-number operations, properties, Cartesian/polar forms and complex-plane representations.

A nonzero complex number has several nth roots because arguments differing by full turns represent the same starting number. Divide all relevant arguments by n to obtain equally spaced roots. De Moivre’s theorem connects this geometry with multiplication, and polynomial factorisation over the complex field records every root with its multiplicity.

Try the mathematics

Task 1. Solve $z^3=8i$. Give all roots in polar and Cartesian form and describe their positions. Check one root algebraically.

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/sm-u34-o1-kk-04/

Study-design reference

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

The learning target is a concise paraphrase. Aspire reference: sm-u34-o1-kk-04. This is an internal identifier, not an official VCAA code.

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