# Calculate with Cartesian/polar complex numbers and interpret operations geometrically

## Key skills | Free preview

Learning target: Calculate with Cartesian/polar complex numbers and interpret operations geometrically.

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-ks-03/

## Study-design reference

VCE Mathematics Study Design 2023-2027, version 1.1 (November 2022). Specialist Mathematics; Units 3–4; Outcome 1; Key skills; bullet 3; p. 115.

The learning target is a concise paraphrase. Aspire reference: sm-u34-o1-ks-03. This is an internal identifier, not an official VCAA code.

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