# Set up and evaluate integrals for areas, volumes, parametric curve lengths and surface areas

## Key skills | Free preview

Learning target: Set up and evaluate integrals for areas, volumes, parametric curve lengths and surface areas.

First identify the geometric quantity and the boundary description. A plane area uses a difference of heights; a washer volume uses a difference of squared radii. Parametric arc length integrates speed, and surface area adds a circumference factor. Limits and repeated tracing must agree with the intended region or path.

## Try the mathematics

Task 1. Find the area between $y=2x$ and $y=x^2$ on $0\leq x\leq 2$. Revolve that region about the x-axis and find its volume. Explain the different integrands.

## Continue with the full worksheet

The complete resource has 3 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-08/

## Study-design reference

VCE Mathematics Study Design 2023-2027, version 1.1 (November 2022). Specialist Mathematics; Units 3–4; Outcome 1; Key skills; bullet 8; p. 115.

The learning target is a concise paraphrase. Aspire reference: sm-u34-o1-ks-08. This is an internal identifier, not an official VCAA code.

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