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5.5 Introduction to integration

Checklist

What you should know

By the end of this subtopic you should be able to:

- understand the connection between differentiation and anti-differentiation

- understand the notation $\int f(x)\mathrm{d}x$ for the indefinite integral (anti-derivative)

- work out anti-derivatives of functions of the form $f(x) = ax^n$ where $n \neq -1$ is an integer, and of sums and differences of this type of function

- understand the importance of the added constant in the indefinite integral and work out its value from a boundary condition

- understand the concept of a definite integral and be familiar with the notation
  $$\int_a^b f(x)\mathrm{d}x$$

- recognise the similarity in the notation for indefinite and definite integrals

- find definite integrals using technology

- appreciate the connection between a definite integral and the areas of a region bounded by the x-axis and the graph of a function.

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