



# INTEGRATION METHODS

CALCULUS

LEVEL 3

## Study Checklist

If you've picked up this checklist, congrats! You've begun the first step in a system of resources designed to help you through the Integration Methods external. To make the most of this, we suggest you sit down, grab a pen, and mark any points that you're feeling a little unsure of. Then, create a subject audit using our template, or refer to the page numbers to find the section in our walkthrough guide to help you out!

### INTEGRATION

- |   |       |   |       |
|---|-------|---|-------|
| <input type="checkbox"/> I can explain what a function is                                       | [TBC] | <input type="checkbox"/> I can explain what cosecant, secant, and cotangent are                                   | [TBC] |
| <input type="checkbox"/> I can explain the relationship between differentiation and integration | [TBC] | <input type="checkbox"/> I can use double angle formulae to solve problems with $\cos^2 x$ or $\sin^2 x$          | [TBC] |
| <input type="checkbox"/> I can use the symbol $\int dx$ and explain what $dx$ means             | [TBC] | <input type="checkbox"/> I can use double angle formulae when there's a number in front of $x$ , like $\cos^2 3x$ | [TBC] |
| <input type="checkbox"/> I can integrate a simple function                                      | [TBC] | <input type="checkbox"/> I can integrate trig products using the formulas on my formula sheet                     | [TBC] |
| <input type="checkbox"/> I can integrate exponentials   | [TBC] | <input type="checkbox"/> I can explain why we write the constant $c$ in integrated functions                      | [TBC] |
| <input type="checkbox"/> I can integrate natural logs   | [TBC] | <input type="checkbox"/> I can find the value of the constant $c$   | [TBC] |
| <input type="checkbox"/> I can integrate trigonometry functions                                 | [TBC] |   |       |

### INTEGRATION RULES

- |  |       |  |       |
|--|-------|--|-------|
| <input type="checkbox"/> I can use the chain rule to integrate a function                        | [TBC] | <input type="checkbox"/> I can integrate products using substitution           | [TBC] |
| <input type="checkbox"/> I can integrate products using the reverse chain rule                   | [TBC] | <input type="checkbox"/> I can integrate functions in the form $(f'(x))/f(x)$  | [TBC] |
| <input type="checkbox"/> I can integrate using substitution when a function's power is very high | [TBC] | <input type="checkbox"/> I can integrate functions in the form $(ax+b)/(cx+d)$ | [TBC] |

## AREAS

- I can explain what a definite integral is [TBC]
- I can use definite integrals to find the area under a function [TBC]
- I can find absolute area (area under the x axis, which is negative) [TBC]
- I can find the area between the curve and the y axis [TBC]
- I can find the areas between two curves [TBC]
- I can subtract two functions into one to make finding the area easier [TBC]
- I can use the trapezium rule to find the area under a curve [TBC]
- I can explain the difference between Simpson's rule and the trapezium rule. [TBC]
- I can use Simpson's rule to find the area under a curve [TBC]

## DIFFERENTIAL EQUATIONS

- I can explain what proportionality is and why constants are needed [TBC]
- I can explain what different proportions tell us about the relationship between two variables [TBC]
- I can write a differential equation based off a word equation [TBC]
- I can solve a differential equation generally, as a function [TBC]
- I can solve a differential equation specifically, as a number value [TBC]
- I can separate variables to integrate [TBC]
- I can use A in exponential functions instead of +c if I've converted them from a differential equation [TBC]
- I can list the types of contexts differential equations will appear in [TBC]
- I can apply differential equations to real-life problems and talk about them in context [TBC]

## KINEMATICS

- I can use integration to turn a function for acceleration into velocity, and from velocity into distance. [TBC]
- I can use kinematics in a definite integral problem [TBC]
- I can use kinematics in a differential equation problem [TBC]

