

$$x + y$$

$$x^2 - 4x + 3 = 0$$
$$(x-1)(x-3) = 0$$

$$a^m + a^n = a^{m+n}$$

# CALCULUS

MATHS

LEVEL 2

## 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 Calculus 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!

### GRADIENTS AND DIFFERENTIATION

- I can explain what the gradient of a graph is [TBC]
- I can identify the parts of a linear equation [TBC]
- I can identify what makes an equation linear [TBC]
- I can find the gradient using rise/run [TBC]
- I can identify a quadratic equation [TBC]
- I can explain what the gradient of a quadratic equation means [TBC]
- I can explain what differentiation is [TBC]
- I can differentiate a simple function [TBC]
- I can differentiate when there's a number in front of  $x$  [TBC]
- I can differentiate when  $x$  has no power [TBC]
- I can differentiate a number without  $x$  [TBC]
- I can differentiate more complicated functions by differentiating each term separately [TBC]
- I can expand/simplify/divide a function before differentiating [TBC]
- I can differentiate negative and fractional powers [TBC]
- I can find the gradient at a point [TBC]

### FUNCTIONS AND GRAPHS

- I can explain what a tangent and a normal are on a graph [TBC]
- I can find the equation of a tangent to a curve [TBC]
- I can find the equation of a normal to a curve [TBC]
- I can define what a turning point is [TBC]
- I can use differentiation to find the coordinates of turning points [TBC]
- I can give a range of values for when a function is increasing or decreasing [TBC]
- I can sketch gradient functions [TBC]

### INTEGRATION

- I can explain what integration is, and how it relates to differentiation [TBC]
- I can use the  $\int dx$  symbol and explain what  $dx$  means [TBC]
- I can integrate functions [TBC]
- I can find the constant  $c$  if a question gives me coordinates to substitute in [TBC]
- I can explain what a definite integral is [TBC]
- I can use definite integrals to find the area under a curve [TBC]
- I can use definite integrals to solve a kinematic problem [TBC]

## DIFFERENTIAL EQUATIONS

- I can explain how different proportions work [TBC]
- I can explain why we need the constant  $k$  in differential equations [TBC]
- I can explain what different proportions tell us about the relationships between variables [TBC]

## RATES OF CHANGE

- I can explain what a rate of change is [TBC]
- I can solve a rate of change problem and give an answer in context [TBC]
- I can solve a rate of change problem using my calculator [TBC]
- I can explain the difference between related rates of change and normal rates [TBC]
- I can solve a rate of change problem [TBC]
- I can use the equations on my formula sheet to find the area and volume of shapes [TBC]

## KINEMATICS

- I can explain what kinematics are [TBC]
- I can explain what velocity is [TBC]
- I can explain what acceleration is [TBC]
- I can solve a kinematic problem [TBC]
- I can solve a kinematic problem that uses exponential functions [TBC]

$$\pi = 3.14\dots$$

x

