Calculus
Checklist

Use this alongside our Walkthrough Guides to tick off the concepts you're confident with to plan your study and find areas of improvement!

Gradients and Differentiation

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

Functions and Graphs

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

Integration

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

Differential Equations

- ◯ I can explain how different proportions work
- ◯ I can explain what different proportions tell us about the relationship between variables
- ◯ I can explain why we need the constant, k, in differential equations

Rates of Change

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

Kinematics

- ◯ I can explain what **kinematics** are
- ◯ I can explain **velocity**
- ◯ I can explain **acceleration**
- ◯ I can solve a kinematic problem
- ◯ I can solve a kinematic problem that uses exponential functions