



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

Basic Differentiation

- I can explain what a **function** is
- I can explain what **differentiation** is
- I can explain what **the function of x** means
- I can differentiate a simple function I can differentiate with coefficients
- I can differentiate when there is no power associated with a variable
- I can differentiate when there are only constants in an equation
- I can differentiate more complicated functions by differentiating each term separately
- I can simplify/expand/divide an expression before I differentiate
- I can differentiate positive and negative powers
- I can differentiate surds and fractional powers
- I can find the gradient at a point by substituting it into a function
- I can find the tangent to a curve
- I can find the normal to a curve

Limits

- I can identify and explain what a continuous function is
- I can identify and explain the three different types of discontinuities
- I can identify where a function can't be differentiated
- I can explain what a **limit** is
- I can identify the two ways in which a limit exists
- I can identify the three ways in which a limit does not exist or is undefined

Features of Functions

- I can explain what stationary points are
- I can identify stationary points as maximums, minimums, turning points, and points of inflection
- I can identify when a function is concave up or concave down
- I can use the second derivative to find the type of stationary point
- I can use differentiation to find whether a function is increasing or decreasing
- I can use the second derivative to find whether the function is concave up or concave down
- I can find the coordinates of any stationary points
- I can sketch the graph of a function based on its stationary points

Rates of Change and Optimisation

- I can explain what rate of change velocity measures
- I can explain what rate of change acceleration measures
- I can use the function to tell if an object is moving at a constant speed
- I can use the function to tell if an object is stationary
- I can use the function to tell if an object is at the origin
- I can use parametric equations to find related rates of change
- I can use differentiation to find the maximum and minimum of a function in a context
- I can solve an optimisation problem