5.10 Second derivative

Checklist

What you should know

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

- find the second derivative of a function and apply it in context
- understand the different notation used for the second derivative
- sketch the first and second derivative without algebraically finding these derivatives
- understand the relationship between the sign of the derivative and the increasing/decreasing behaviour of the graph of a function
- understand the relationship between the sign of the second derivative and the concavity of the graph of a function
- identify stationary points and classify these as maxima, minima and points of inflexion
- identify points of inflexion and classify these as stationary and non-stationary
- draw sketches based on information about the first and second derivative
- translate word problems into functions relating variables, and use constraint equations to ensure that the functions are dependent on one variable only; then apply differentiation to find the optimum solution (maximum or minimum).