InkMaths

QUESTION WORKBOOK

Tangents, turning points and curve behaviour

Differentiation · Year 12–13

7 questions · 20 marks

PRINT EDITION

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SECTION A · Warm-up

A1 Find the equation of the tangent to $y = x^2$ at the point $(2, 4)$. [2]

A2 Find the equation of the normal to the same curve at the same point. [2]

SECTION B · Standard

B1 Find and classify the stationary points of $y = x^3 - 3x^2 - 9x + 5$. [4]

B2 For the same curve, state the interval on which y is decreasing. [3]

B3 Show that $y = x^3$ has a stationary point at the origin that is neither a maximum nor a minimum. [3]

SECTION C · Stretch

C1 A rectangle has perimeter 40 cm. Use calculus to find the dimensions giving the greatest area, and state that area. [4]

C2 State the second-derivative test for classifying a stationary point, and what must be done in the case it fails to decide. [2]