InkMaths

QUESTION WORKBOOK

Integration by substitution and by parts

Integration · Year 12–13

6 questions · 20 marks

PRINT EDITION

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SECTION A · Warm-up

A1 Find $\int 2x(x^2 + 1)^3\,dx$ by recognising a reverse chain pattern. [2]

A2 Find $\int 2x/(x^2 + 3)\,dx$. [3]

SECTION B · Standard

B1 Use the substitution $u = x^2 + 1$ to find the exact value of $\int_0^2 x(x^2 + 1)^3\,dx$. [4]

B2 Use integration by parts to find $\int xe^{2x}\,dx$. [4]

B3 Use integration by parts to find $\int x \ln x \, dx$. [4]

SECTION C · Stretch

C1 Find the exact value of $\int_0^{\pi/2} x \sin x \, dx$. [3]