InkMaths

QUESTION WORKBOOK

Polynomials and the factor theorem

Algebra and functions · Year 12–13

6 questions · 22 marks

NAVY SCREEN EDITION

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SECTION A · Warm-up

A1 Show that $(x - 2)$ is a factor of $f(x) = x^3 - 4x^2 + x + 6$. [2]

A2 Divide $x^3 - 4x^2 + x + 6$ by $(x - 2)$. [3]

SECTION B · Standard

B1 Hence factorise $f(x) = x^3 - 4x^2 + x + 6$ completely, and state its roots. [3]

B2 Divide $2x^3 + 3x^2 - 5$ by $(x + 2)$, stating the quotient and remainder. [3]

B3 Show that $(2x - 1)$ is a factor of $f(x) = 2x^3 + 5x^2 - x - 1$, and express $f(x)$ as $(2x - 1)$ times a quadratic. [4]

SECTION C · Stretch

C1 Given that $(x - 2)$ and $(x + 3)$ are both factors of $f(x) = x^3 + ax^2 + bx - 30$, find the value of a and the value of b, and hence factorise $f(x)$ completely. [7]