



QUESTION WORKBOOK

The Euclidean algorithm and Bezout's identity

Further Pure 2 · Year FM

7 questions · 28 marks

NAVY SCREEN EDITION

SECTION A · Warm-up

A1 Use the Euclidean algorithm to find the highest common factor of 1001 and 357.

[3]

A2 The Euclidean algorithm applied to 1001 and 357 gives $1001 = 2 \times 357 + 287$, $357 = 1 \times 287 + 70$, $287 = 4 \times 70 + 7$ and $70 = 10 \times 7$. Express the highest common factor in the form $1001x + 357y$.

[3]

SECTION B · Standard

B1 Find the highest common factor of 2024 and 748, and write it in Bezout form.

[4]

B2 Show that 391 and 299 are not coprime, and state their highest common factor.

[3]

B3 Use Bezout's identity to find the multiplicative inverse of 11 modulo 26.

[4]

B4 Find all integer solutions of $12x + 45y = 6$.

[4]

SECTION C · Stretch

- C1** Use the Euclidean algorithm to show that 84 and 55 are coprime, and find integers x and y such that $84x + 55y = 1$. Hence write down the multiplicative inverse of 55 modulo 84, and give the general solution of $84x + 55y = 1$. [7]