



QUESTION WORKBOOK

Transformations of the complex plane

Further Pure 2 · Year FM

6 questions · 26 marks

NAVY SCREEN EDITION

SECTION A · Warm-up

- A1** The transformation $w = z + 2 - i$ is applied to the circle $|z| = 3$. Find the equation of the image in the w -plane. [3]

- A2** Describe the transformation $w = 2iz$ geometrically, and find the image of $|z - 1| = 1$. [4]

SECTION B · Standard

- B1** Show that $w = 1/z$ maps the line $\operatorname{Re}(z) = 1/2$ onto a circle, and give its centre and radius. [5]

- B2** Find the image of the circle $|z| = 2$ under $w = 1/z$, and explain what happens to the direction of travel. [4]

- B3** Find the image of the line $\operatorname{Re}(z) = 1$ under $w = z^2$. [4]

SECTION C · Stretch

- C1** Show that $w = (z + 1)/(z - 1)$ maps the unit circle $|z| = 1$ onto the imaginary axis, apart from one missing point. [6]