

Exercise 1 / 7

- a) Give the complex function that corresponds to a rotation by 90° about the origin.
- b) Give the simplest geometrical description of the transformation associated to the complex function $f(z) = (-1 + 2i)z$
- c) Determine the invariant point of the transformation associated to the function $f(z) = 2iz - 1$

Exercise 2 / 5

We consider the function $f(z) = z^2 + i \cdot \bar{z}$

- a) Give the image of $-2 + 3i$
- b) The image of $z = x + iy$ is $f(z) = u + iv$. Express u and v as functions of x and y .

Exercise 3 / 6

The image of $z = x + iy$ under a function f is $f(z) = u + iv$ with $\begin{cases} u = 2x^2 + y \\ v = x^2 + y^2 - 4x + 1 \end{cases}$

- a) Describe the image of the line $x = -1$ by giving its cartesian equation and its name.
- b) Describe the curve whose image is the line $v = 13$. Give its name and characteristics.