



COMPLEX PLANE

Why

We are regularly thinking of \mathbf{C} as plane.

Definition

Since $\mathbf{C} = \mathbf{R}^2$, we can identify elements of \mathbf{C} with points in the plane (as we did in **Real Plane**). In this case, if $z = x + iy \in \mathbf{C}$ (i.e, $z = (x, y) \in \mathbf{R}^2$), we can visualize this identification in the following figure.

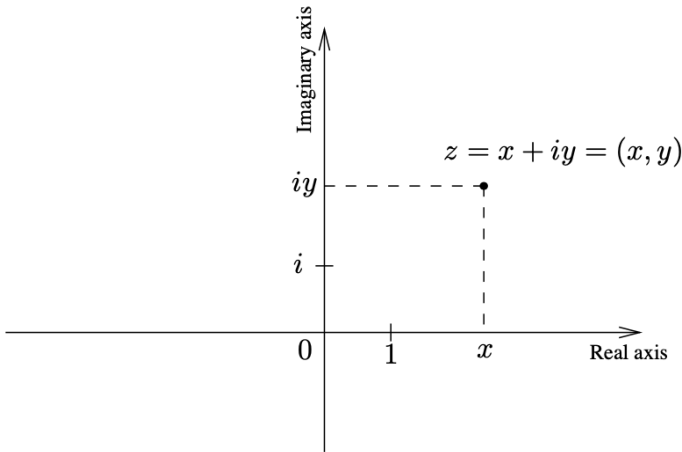


Figure 1: The complex plane

We can identify the origin with the complex number $(0, 0) = 0 \in \mathbf{C}$. For this reason we call $0 \in \mathbf{C}$ the *complex origin*. Likewise, the imaginary number $(0, 1) = i \in \mathbf{C}$ corresponds to $(0, 1)$. Clearly, the horizontal axis corresponds to the purely

real numbers and the vertical axis corresponds to the purely imaginary numbers. For these reasons, we refer to these axes as the *real axis* and *imaginary axis*, respectively. We refer to Figure 1 as the *complex plane* (or *Argand diagram*).

