$$\Delta p \Delta x \geq \frac{\hbar}{2}$$

$$z = w^2 + 2iw$$

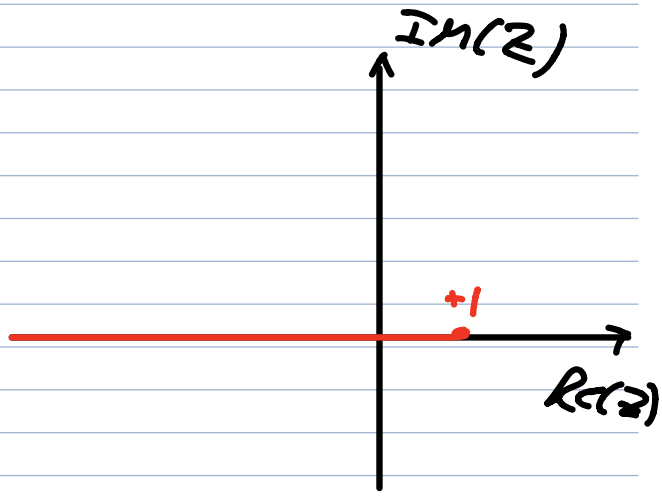
$$w = u + iv$$

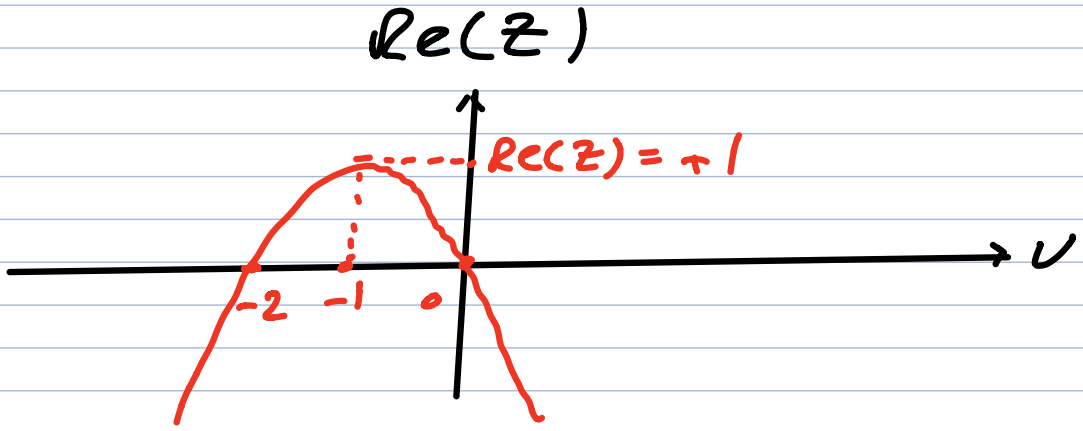
$$u = 0$$

$$\Rightarrow w = iv$$

$$z = -v^2 - 2v$$

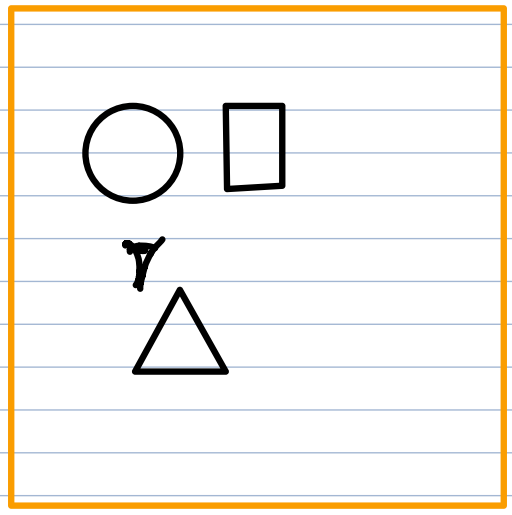
$$z = -v(v+2)$$



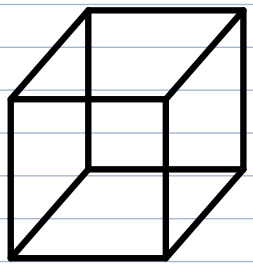


$$x^2 + y^2 + z^2 + w^2 = R^2$$

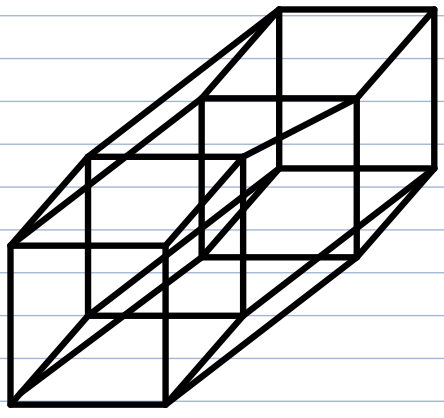
0D 1D



2D



3D



'Tesseract'

4D

$$\nabla \cdot \mathbf{B} = 0$$

$$\nabla \cdot \mathbf{E} = \frac{\rho}{\varepsilon_0}$$

$$\nabla \times \mathbf{B} = \mu_0 \mathbf{I} + \mu_0 \varepsilon_0 \frac{\partial \mathbf{E}}{\partial t}$$

$$\nabla \times \mathbf{E} = -\frac{\partial \mathbf{B}}{\partial t}$$

$$\mathbf{i} \times \mathbf{j} = \mathbf{k} \quad , \quad \mathbf{j} \times \mathbf{i} = -\mathbf{k}$$

$$\mathbf{j} \times \mathbf{k} = \mathbf{i}$$

$$\vdots$$

$SO(3)$: $ds^2 = dx^2 + dy^2 + dz^2$

$SO(1,3)$: $ds^2 = -dt^2 + dx^2 + dy^2 + dz^2$

q

Lorentz group

$SU(3) \leftarrow QCD$