\[ a^2 + b^2 + c^2 = 1 \]

in \( \mathbb{R}^3 \) \((a, b, c)\) coords)

and put in \( C \) as \( c = 0 \).

Connect \( z \in C \) via a straight line segment to the North pole.

There is a unique intersection, which is \( \Pi_0 \Theta(z) \).

The inverse mapping is called "stereographic projection".

So \( \infty \) is naturally seen there as "compactifying" \( C \).

By the way, the map \(^?\) in this case is a map \( S^3 \to \mathbb{CP}^1 = S^2 \) whose fibre is \( S^1 \); this is an important example in topology, called the Hopf map.

What do the inside of the unit disc (called \( D \) in Remmert) and the upper \( \frac{1}{2} \) plane (called \( H \) in Remmert) look like on the sphere? They both look like hemispheres—very much the same, even though one has boundary a circle \((|z|^2 = 1)\) and the other a line \((\Re z = 0)\). More explanation: