so $\mathbb{CP}^1$ is connected. Given a sequence $(w_j) \in \mathbb{C}$, when does $[w_j : 1] \to [1:0]$? A little thought should convince you that it should be possible to choose representatives in $S^3 \subset \mathbb{C}^{2*}$ of $[w_j : 1]$, call them q_j, so that $q_j \to (1,0) \in S^3$. Thus the first coordinates are not 0 for j large enough. And (j large) $[w_j : 1] = [1 : \frac{1}{w_j}] \to [1:0] \iff$ the modulus, $|w_j|$ grows without bound: $\forall M > 0 \ \exists J_M$ s.t. if $j \geq J_M$, $|w_j| \geq M$. The "point" $[1:0]$ is called "∞". And what we have just described is the one-point compactification of $\mathbb{C}^1$ (also of $\mathbb{R}^2$: confusion abounds!), $\mathbb{CP}^1$, as $\mathbb{C} \cup \{\infty\}$, with nbd of ∞ being complements of compact sets (closed, bdd sets!). But everyone "knows" that S^2 is such a space. Thus $\mathbb{CP}^1$ is also called the <u>Riemann sphere</u>. A way of "seeing" $\pi \circ \sigma : \mathbb{C} \to \mathbb{CP}^1$ (onto, except for ∞) is to draw