1. We can use the natural coordinates on S^1 induced by

2.

3. Cover S^2 by charts $U_1 = S^2 \setminus \{N\}, U_2 = S^2 \setminus \{S\}$, with stereographic projection coordinates $\varphi_1(x,y,z) = (\frac{x}{1-z}, \frac{y}{1-z})$ and $\varphi_2(x,y,z) = (\frac{x}{1+z}, \frac{y}{1+z})$. Cover $\mathbb{CP}^1$ in charts $V_1 = \{(z_1,z_2)|z_1 \neq 0\}, V_2 = \{(z_1,z_2)|z_2 \neq 0\}$, with coordinates $\phi_1(z_1,z_2) = \frac{z_2}{z_1}, \phi_2(z_1,z_2) = \frac{z_1}{z_2}$.

For any point p other than N, we check that F maps p smoothly from !!! to !!!