Complex Geometry. HW 2

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(7.5) Let $x = x_0$ be a point in $\mathbb{CP}^1$ such that $x_0 \neq 0$ and so $y = \frac{1}{x_0}$. In this case we can consider the fibers of this point in both charts. Notice that $\pi^{-1}(x_0) = \{(x = x_0, u) | u \in \mathbb{C}\}$ and like wise $\pi^{-1}(1/x_0) = \{(y = 1/x_0, v) | v \in \mathbb{C}\}$. From the transition function we know that the point $(x = x_0, u = u_0) = (y = y_0, u_0/x_0^d)$ which gives a linear isomorphism from the u coordinate to the v coordinate: $v = u/x_0^d$.

(8.6) Let $s_j : \mathbb{CP}^1 \to \mathcal{O}_{\mathbb{CP}^1}(d)$ be a section for the line bundle $\pi : \mathcal{O}_{\mathbb{CP}^1}(d) \to \mathbb{CP}^1$ for all $j = 0, \ldots r$. From (8.4) we know that if $d \geq 0$ that every section is equivalent to a homogenous polynomial $F_j(X : Y)$ of degree d, and so this defines the map $[F_0(X : Y) : F_1(X : Y) : \cdots : F_r(X : Y)]$ which is a regular map from $\mathbb{CP}^1 \to \mathbb{CP}^r$.