1. Show that the geodesics $\gamma$ of $\mathbb{C}P^n$ with $\gamma(0) = \pi(\tilde{x}) = x$ are of the form $t \mapsto \pi((\cos t)\tilde{x} + (\sin t)\tilde{v})$, where

$$\pi: (S^{2n+1}, g_{\text{std}}) \to (\mathbb{C}P^n, h_{\text{std}})$$

is the canonical Riemannian submerion and $\tilde{v} \in T_{\tilde{x}}S^{2n+1} \subseteq T_{\tilde{x}}\mathbb{C}^{n+1}$ is orthogonal to $\tilde{x}$ and $i\tilde{x}$.

2. Let $M$ be a manifold with connection $\nabla$. If $Y$ is a vector field on $M$ and $c: I \to M$ is a curve such that $c'(0) = v \in T_pM$, then $\nabla_v Y$ depends only on the values of $Y$ along $c$. That is if $X$ is another vector field and $X \circ c = Y \circ c$, then $\nabla_v X = \nabla_v Y$. 

Chp. 4 (do Carmo): 1, 2, 3, 4, 6, & 7