1) Given a vector \( a = (a_1, \ldots, a_n) \in \mathbb{N}_{>0}^n \), let

\[
V(a) = \{ (z_1, \ldots, z_n) \in \mathbb{C}^n \mid |z_1|^2 + \cdots + |z_n|^2 = 1, \ z_1^a_1 + \cdots + z_n^a_n = 0 \}.
\]

Prove that \( V(a) \) is a smooth manifold of (real) dimension \( 2n - 3 \).

2) Let \( M \) be an \( n \)-manifold and \( F : M \rightarrow M \) a diffeomorphism. The suspension of \( F \) is defined by taking \( M \times [0,1] \) and identifying every point \( (x,0), x \in M \) with \( (F(x),1) \), and is denoted by \( M_F \).

(a) Show that \( M_F \) is an \((n+1)\)-manifold

(b) What is \( M_{Id} \)?