1. Let $C = A \cup B$. Show that 
\[ s_n(C) \leq s_n(A) + s_n(B). \]

2. Let $C = \{ A \cup B; \ A \in A, \ B \in B \}$. Show that 
\[ s_n(C) \leq s_n(A)s_n(B). \]

3. Let $f : \mathbb{R} \to \mathbb{R}$ be a function such that $f(x) \geq 0$ for all $x$ and $\sup_x f(x) \leq C < \infty$ for some $C$. Let $L_t = \{ x : f(x) > t \}$. Let $A = \{ A_t : t \geq 0 \}$. Find the VC dimension of $A$.


