X is f.d normed X, $A \subset X$ is a convex subset s.t $0 \in A$ and the linear span of A is X show that int A is not empty.

Want to show that int $A \neq \emptyset$

let D be the dimmension of X since X is spanned by A we can write $X_i = (0, .., \underset{i}{\hat{1}}, 0, .., 0)$ as $c_i a_i$ where $a_i \in A$. since we can always multiply by a constant we can assume $\|X_i\| = 1$ thus $\|a_i\| = \frac{1}{|c_i|} \neq 0$ by convexity all points $t a_i \in A$, $t \in [0,1]$ for $|t| < 1$ $t a_i \in B(0, \frac{1}{|c_i|})$ thus pick $C = \max\limits_{1 \le i \le D} \{|c_i|\}$ then $B(0, \frac{1}{C}) \subset A$ and thus int $A \neq \emptyset$