proof of properties of extreme subsets of a closed convex set

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For the first claim, it is obvious that $\bigcap_{i \in I} A_i$ is closed http://planetmath.org/ConvexSetconve subset of K. Let $z \in A$ and $0 < t < 1$, $x, y \in K$ such as $z = tx + (1 - t)y$. Then $z \in A_i$, for all $i \in I$ so we have that $x, y \in A_i$ for all $i \in I$. Therefore $x, y \in \bigcap_{i \in I} A_i$.

For the second claim suppose $x, y \in K$, $t \in (0, 1)$ and $z \in A$ such as $z = tx + (1 - t)y$. From the hypothesis $A \subset B$ we have that $z \in B$ and since B is an extreme subset of K, $x, y \in B$. Analogously from the hypothesis that A is an extreme subset of B, we have that $x, y \in A$.