1. hyperplane $A=\{x \mid a'x=b\}$, b scalar

$\Rightarrow$ A closed, convex

proof: ① $\bar{A}=A$?

let $y\in A$, $\because y_n\to y$, $\{y_n\}\subset A$

$\because a'y_n=b$, $\forall n$, $\therefore a'y=b$ $\therefore y\in A$.

$\therefore \bar{A}\subset A$, $\therefore \bar{A}=A$. $\therefore A$ closed

② $\forall x,y\in A$, $\therefore a'x=b$, $a'y=b$

$\because a'(\alpha x+(1-\alpha)y)=b$

$\therefore \alpha x+(1-\alpha)y\in A$. $\therefore A$ convex

2. ~~halfspace~~ halfspace $A=\{x \mid a'x\le b\}$

$\Rightarrow$ A closed, convex

proof: change $=$ in $|$ to $\le$.

3. polyhedral $A=\{x \mid a_j'x\le b_j, j=1,\cdots,r\}$

$A\neq\phi$, $\Rightarrow$ A closed, convex

4 subspace $\subset$ polyhedral cone $\subset$ polyhedral set