



**Definition**

For any  $a \in \mathbf{R}^n$  and  $\alpha \in \mathbf{R}$ , the sets

$$\{x \in \mathbf{R}^n \mid a^\top x \leq \alpha\}, \quad \{x \in \mathbf{R}^n \mid a^\top x \geq \alpha\}$$

are called *closed halfspaces* and the sets

$$\{x \in \mathbf{R}^n \mid a^\top x < \alpha\}, \quad \{x \in \mathbf{R}^n \mid a^\top x > \alpha\}$$

are called *open halfspaces*.



