



**Definition**

The *projection* of  $x \in \mathbf{R}^n$  onto the subset  $S \subset \mathbf{R}^n$  is the point in  $S$  closest to  $x$ .

**Notation**

We sometimes the projection of  $x$  onto  $S$  by  $\text{proj}_S(x)$ . We have

$$\text{proj}_S(x) = \underset{z \in S}{\operatorname{argmin}} \|x - z\|$$



