



## Definition

An optimization problem  $(X, f)$  is an *equality constrained space optimization problem* if  $X \subset \mathbf{R}^n$ ,  $f : \mathbf{R}^n \rightarrow \mathbf{R}$ , and there exists  $h : \mathbf{R}^n \rightarrow \mathbf{R}^m$  so that

$$X = \{x \in \mathbf{R}^n \mid h(x) = 0\}$$

For this reason,  $(f, h)$  is sometimes called the *problem data* (*abstract problem data*) of the problem.

## Notation

We often write such problems as: given  $f : \mathbf{R}^n \rightarrow \mathbf{R}$  and  $h : \mathbf{R}^n \rightarrow \mathbf{R}^m$ , find  $x \in \mathbf{R}^n$  to

$$\begin{array}{ll} \text{minimize} & f(x) \\ \text{subject to} & h(x) = 0 \end{array}$$

Some authors abbreviate equality constrained space optimization problem as ECP.



