



## Real Optimizers

### 1 Why

Often the chain considered in optimization is the real numbers.

### 2 Definition

A function from a non-empty set to the real numbers, in the context of optimizers, is called an *objective function* for the *feasible set* (its domain). Suppose the feasible set is a subset of real numbers. Often we can specify a function defined for every real number. The *objective function* is the restriction of this function to those elements which are *feasible*.

### 3 Notation

Let  $D$  be a non-empty set, a mnemonic for "domain." Let  $f : D \rightarrow \mathbf{R}$ . Often we have  $g : A \rightarrow \mathbf{R}$ , where  $D \subset A$ . So  $f$  is the restriction of  $g$  to the feasible set  $D$ . In this case the language feasible set language is especially useful, as an correspond to a minimal element of  $g(A)$ , a larger set than  $g(D)$ . In this case, it is useful to speak of feasible elements.