



## Definition

A function  $f : \mathbf{R}^n \rightarrow \mathbf{R}$  is *linear* if

1.  $f(x + y) = f(x) + f(y)$  for all  $x, y \in \mathbf{R}^n$  and
2.  $f(\alpha x) = \alpha f(x)$  for all  $x \in \mathbf{R}^n$  and  $\alpha \in \mathbf{R}$ .

There are simple consequences to these conditions. For example,  $f(0) = 0$ .



