



## Why

Since the function space  $\mathbf{R} \rightarrow \mathbf{R}$  is a vector space, can we approximate a “complex” element of this set by some basis of “simpler” functions in  $\mathbf{R} \rightarrow \mathbf{R}$ .

Of course, there may be no set that can represent  $f$ . So instead we may be interested in an element  $g \in \mathbf{span}\{g_1, \dots, g_d\}$  which approximates  $f$ .<sup>1</sup>

## Definition

A *real function approximator* for a function  $f : \mathbf{R} \rightarrow \mathbf{R}$  is a function  $g : \mathbf{R} \rightarrow \mathbf{R}$ .

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<sup>1</sup>Future editions will modify.



