

Exercise 6

In this section we discussed examples of ordinary, everyday functions: Population is a function of time, postage cost is a function of weight, water temperature is a function of time. Give three other examples of functions from everyday life that are described verbally. What can you say about the domain and range of each of your functions? If possible, sketch a rough graph of each function.

Solution

Example 1: The speed of a car as one drives is a function of time: $s = s(t)$. The domain is $\{t \mid 0 \leq t \leq \text{duration of ride}\}$, and the range is $\{s \mid 0 \leq s \leq \text{maximum speed}\}$.

Example 2: The temperature distribution in a rectangular room is a function of position: $T = T(x, y, z)$. The domain is $\{(x, y, z) \mid a \leq x \leq b, c \leq y \leq d, e \leq z \leq f\}$, and the range is $\{T \mid (\text{minimum temperature}) \leq T \leq (\text{maximum temperature})\}$.

Example 3: The height of a plane is a function of time: $z = z(t)$. The domain is $\{t \mid 0 \leq t \leq (\text{duration of flight})\}$, and the range is $\{z \mid (\text{minimum height}) \leq z \leq (\text{maximum height})\}$.