7. Domain of functions

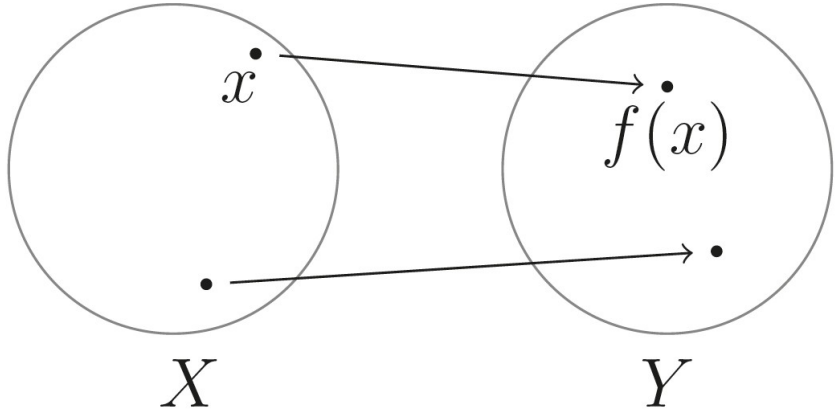
Definition

A *function* or *mapping* f *from a set* X *into a set* Y is a law (mathematical correspondence) which associates to every element of X a uniquely determined element of Y.

If f is a function from X into Y then we adopt the following notation:

$$f : X \to Y.$$

We say that X is the *domain* of f and Y is the *codomain* of f.



$$f : X \to Y$$

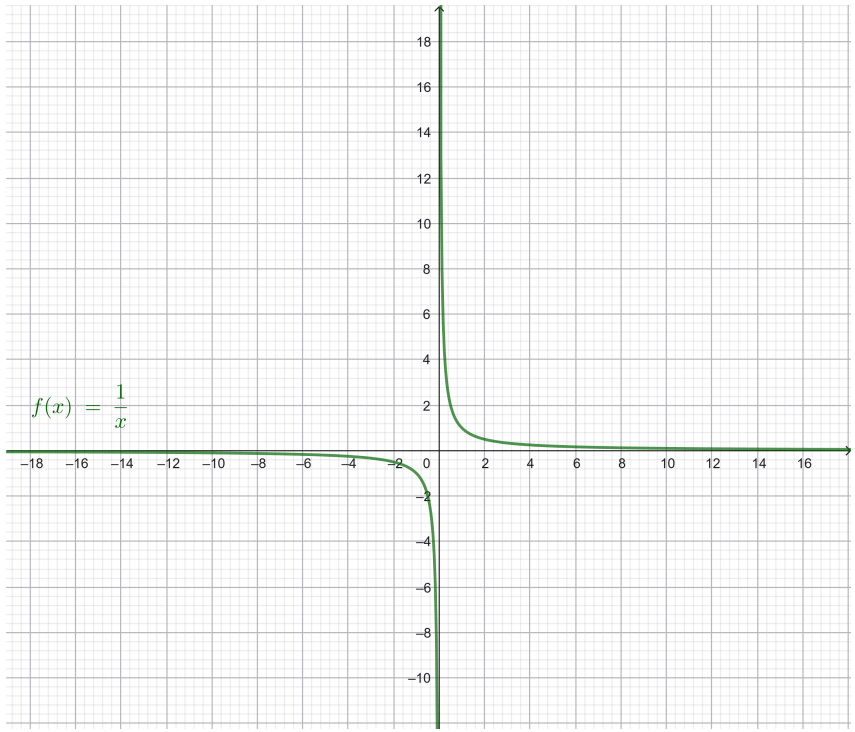
Remark

The domain *of a function is the set where f is well-defined.*

Example

We consider the function

$$f(x) = \frac{1}{x}.$$

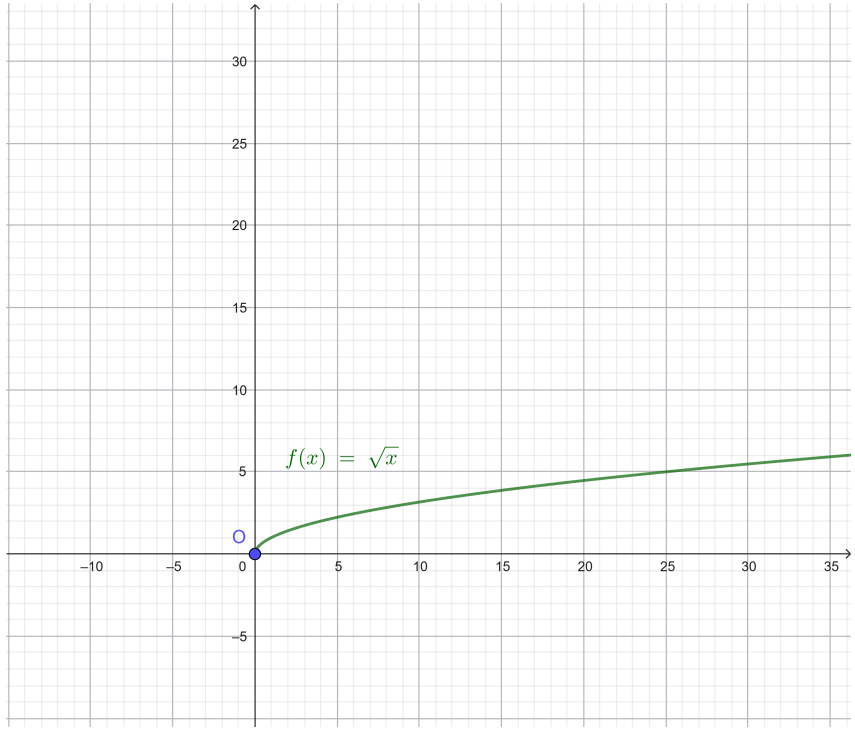


Then, the domain is $\mathbb{R} \setminus \{0\}$.

Example

We consider the function

$$f(x) = \sqrt{x}\,.$$

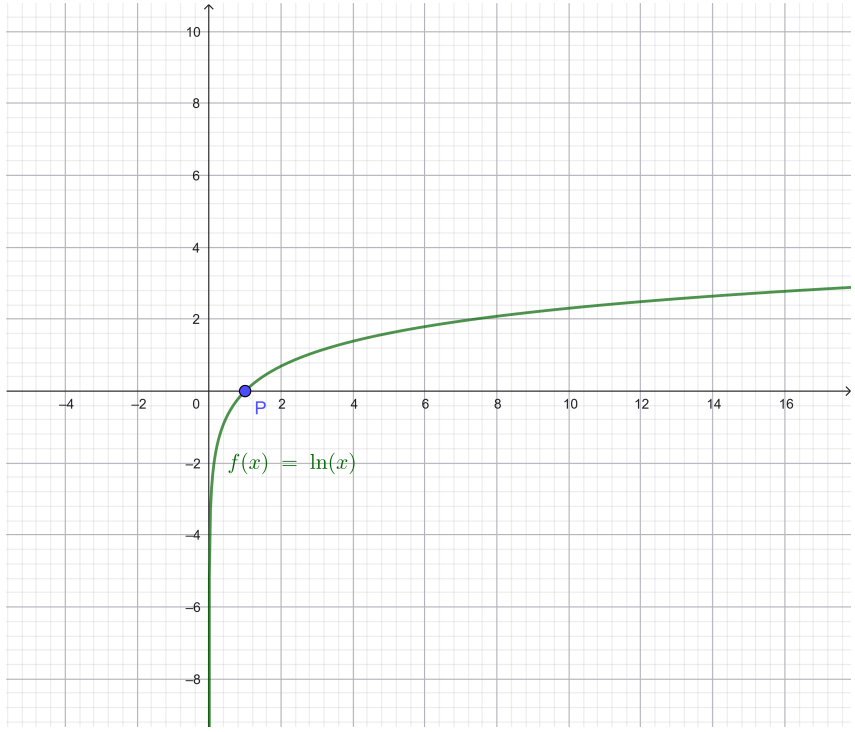


Then, the domain is $\{x \in \mathbb{R} : x \geq 0\}$.

Example

We consider the function

$$f(x) = \ln(x)\,.$$



Then, the domain is $\{x \in \mathbb{R} : x > 0\}$.