

Simple function (without mapping) used inside a paragraph  $f : \mathbb{R} \rightarrow \mathbb{R}$  as inline math.

Simple function (with mapping) used inside a paragraph  $f : \mathbb{R} \rightarrow \mathbb{R}$  as inline math.

Simple function as rendered in display math:

$$f : \mathbb{R} \rightarrow \mathbb{R}$$

Simple function with definition:

$$f : \mathbb{R} \rightarrow \mathbb{R}$$

Function with alternative writing:

$$\exp : \mathbb{R} \rightarrow \mathbb{R}$$

Function with alternative notation and definition:

$$\exp : \mathbb{R} \rightarrow \mathbb{R}$$

Or forcing display math inside the definition:

$$\begin{aligned} \exp : \mathbb{R} &\rightarrow \mathbb{R} \\ &\mapsto e^x \end{aligned}$$

Function with different domain and codomain:

$$\begin{array}{lll} \text{sqrt} : \mathbb{N} \rightarrow \mathbb{R} & \text{sqrt} : \mathbb{N} \rightarrow \mathbb{R} & \text{sqrt} : \mathbb{N} \rightarrow \mathbb{R} \\ \mapsto \sqrt{n} & \mapsto \sqrt{n} & \mapsto \sqrt{n} \end{array}$$

Functions with multiple variables

$$\begin{aligned} f : A \times B &\rightarrow C \\ (a, b) &\mapsto f((a, b)) \end{aligned}$$

Unitary operator

$$\begin{aligned} \exp : \mathbb{R} &\rightarrow \mathbb{R} \\ () &\mapsto \exp() \end{aligned}$$

Binary operator

$$\begin{aligned} + : \mathbb{R} &\rightarrow \mathbb{R} \\ (x, y) &\mapsto +((x, y)) \end{aligned}$$

Using macros in definition:

$$\begin{array}{ll} \langle , \rangle : \mathbb{R}^2 \rightarrow \mathbb{R} & \| \| : \mathbb{R}^2 \rightarrow \mathbb{R} \\ (x, y) \mapsto \langle , \rangle ((x, y)) & (x, y) \mapsto \| \| ((x, y)) \end{array}$$

More complex definitions, requiring a third line:

$$\begin{aligned} + : \mathbb{R}^{\mathbb{R}} &\rightarrow \mathbb{R}^{\mathbb{R}} \\ (f, g) &\mapsto +((f, g)) \end{aligned}$$