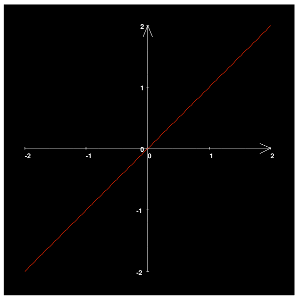
10.2. Beispiele (i) Konstante Funktionen $f : \mathbb{C} \to \mathbb{C}, z \mapsto f(z) = c$, wobei $c \in \mathbb{C}$ eine Konstante ist.

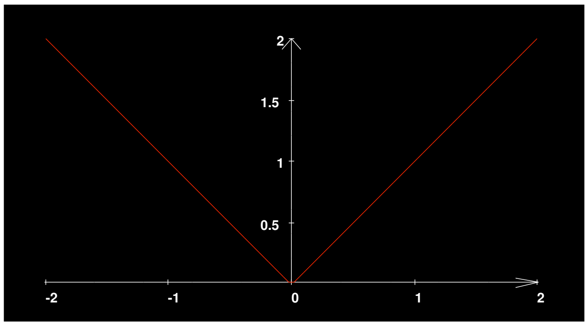
(ii) Die identischen Abbildungen $\mathrm{id}_{\mathbb{C}} : \mathbb{C} \to \mathbb{C}, z \mapsto z$, und $\mathrm{id}_{\mathbb{R}} : \mathbb{R} \to \mathbb{R}, x \mapsto x$, mit dem Graphen

```
>> plot2d(Axes = Origin, Ticks = 5, Labeling = TRUE, Labels = [" ", " "],
Arrows =TRUE, [Mode = Curve, [x, x], x = [-2, 2], Grid = [100]]);
```



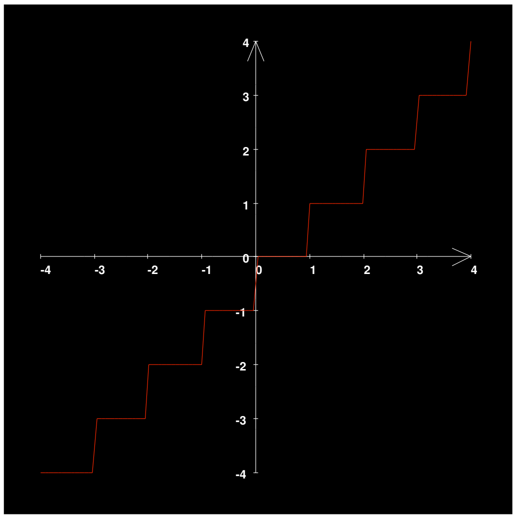
(iii) Der Absolutbetrag $\mathrm{abs} : \mathbb{C} \to \mathbb{C}, z \mapsto |z|$, und die reelle Version $\mathrm{abs}_{\mathbb{R}} : \mathbb{R} \to \mathbb{R}, x \mapsto |x|$, mit dem Graphen

```
>> plot2d(Axes = Origin, Ticks = 5, Labeling = TRUE, Labels = [" ", " "],
Arrows =TRUE, [Mode = Curve, [x, abs(x)], x = [-2, 2], Grid = [100]]);
```



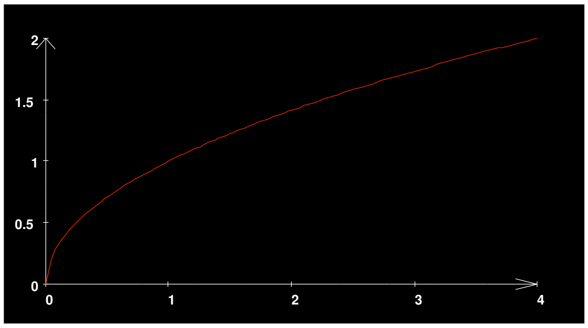
(iv) Die floor-Funktion $\mathrm{floor} : \mathbb{R} \to \mathbb{R}, x \mapsto \lfloor x \rfloor$, mit dem Graphen

```
>> plot2d(Axes = Origin, Ticks = 8, Labeling = TRUE, Labels = [" ", " "],
       [Mode = Curve, [x, floor(x)], x = [-4, 4], Grid = [100]]);
```



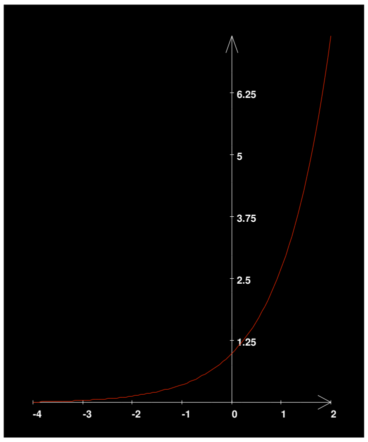
(v) Die <u>(Quadrat)wurzelfunktion</u> sqrt : $\mathbb{R}_{\geq 0} := \{x \in \mathbb{R} \mid x \geq 0\} \to \mathbb{R}, x \mapsto \sqrt{x}$, mit dem Graphen

```
plot2d(Axes = Origin, Ticks = 5, Labeling = TRUE, Labels = [" ", " "],
         Arrows =TRUE, [Mode = Curve, [x, sqrt(x)], x = [0, 4], Grid =
         [100]]);
```



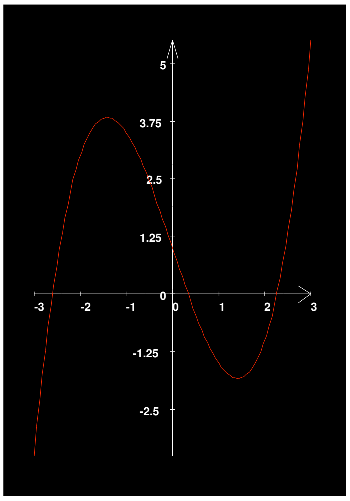
(vi) Die Exponentialfunktion exp : $\mathbb{C} \to \mathbb{C}, z \mapsto \exp(z)$, und ihre reelle Version $\exp_{\mathbb{R}} : \mathbb{R} \to \mathbb{R}, x \mapsto \exp(x)$, mit dem Graphen

```
>> plot2d(Axes = Origin, Ticks = 7, Labeling = TRUE, Labels = [" ", " "],
Arrows =TRUE, [Mode = Curve, [x, exp(x)], x = [-4,2], Grid = [100]]);
```



(vii) Polynomfunktionen $p : \mathbb{C} \to \mathbb{C}, z \mapsto p(z) := a_n z^n + \ldots + a_1 z + a_0$, mit $a_0, \ldots, a_n \in \mathbb{C}$.

```
>> plot2d(Axes = Origin, Ticks = 7, Labeling = TRUE, Labels = [" ", " "],
Arrows =TRUE,  [Mode = Curve, [x, 1/2 * x^3 - 3 * x + 1], x = [-3,3], Grid
= [100]]);
```



(viii) Es seien $p, q : \mathbb{C} \to \mathbb{C}$ Polynomfunktionen, und es sei D eine Teilmenge von $\{z \in \mathbb{C} \mid q(z) \neq 0\}$. Dann ist die Funktion $r : D \to \mathbb{C}, z \mapsto r(z) := \frac{p(z)}{q(z)}$, definiert. Man bezeichnet sie mit $\frac{p}{q}$ und nennt sie eine rationale Funktion.

```
>> plot2d(Axes = Origin, Ticks = 5, Labeling = TRUE, Labels = [" ", " "],
Arrows =TRUE,  [Mode = Curve, [x, x/(20*(1 - x^2))], x = [-2,2], Grid =
[150]]);
```