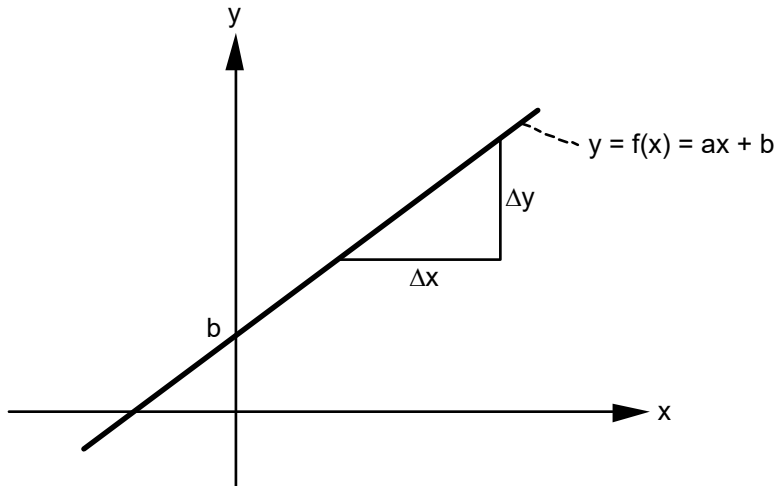


# Linear function

## Definition

$f: D \rightarrow \mathbb{R}$	$(D \subseteq \mathbb{R})$
$x \mapsto y = f(x) = ax + b$	$(a \in \mathbb{R}, b \in \mathbb{R})$



$a = \frac{\Delta y}{\Delta x}$  : **slope**

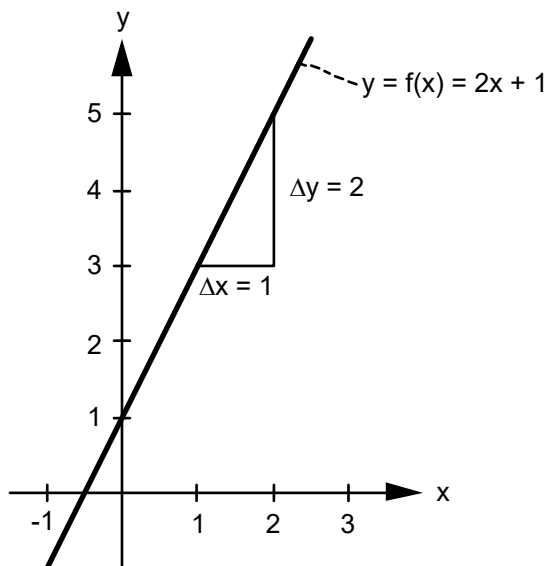
special case  $a = 0$ : **constant function**

$b$  : **intercept**

special case  $b = 0$ : **direct proportionality** ("y is directly proportional to x.")

## Examples

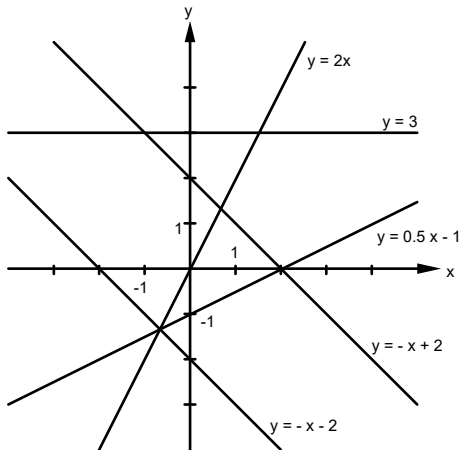
1.  $f: \mathbb{R} \rightarrow \mathbb{R}$   
 $x \mapsto y = f(x) = 2x + 1$



Slope  
Intercept

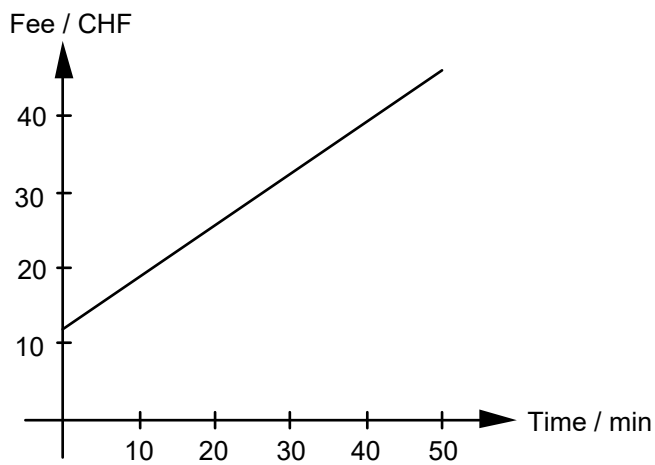
$$a = \frac{\Delta y}{\Delta x} = \frac{2}{1} = 2$$
$$b = 1$$

2. Graphs of some linear functions



3. Mobile phone tariff

Monthly fee: 12 CHF basic fee plus 0.70 CHF per minute



4. Simple interest

Initial balance = 2000 CHF, interest rate = 2.5%

