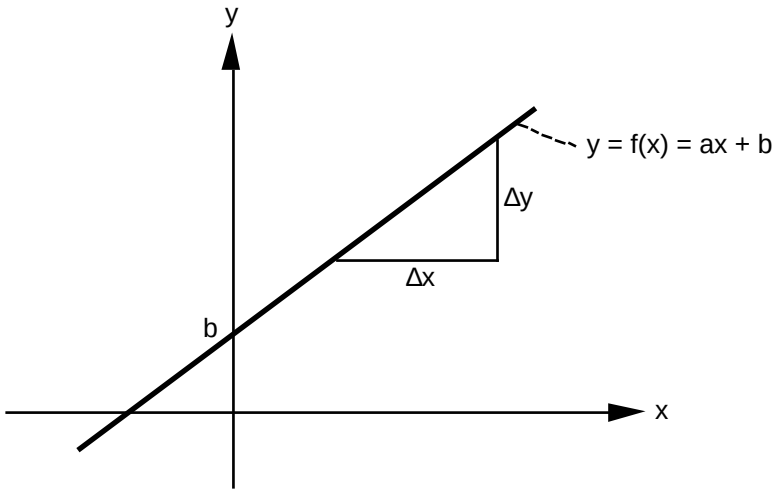
Linear function

Definition

f: D → ℝ	(D ⊆ ℝ)
x → y = f(x) = ax + b	(a ∈ ℝ, b ∈ ℝ)

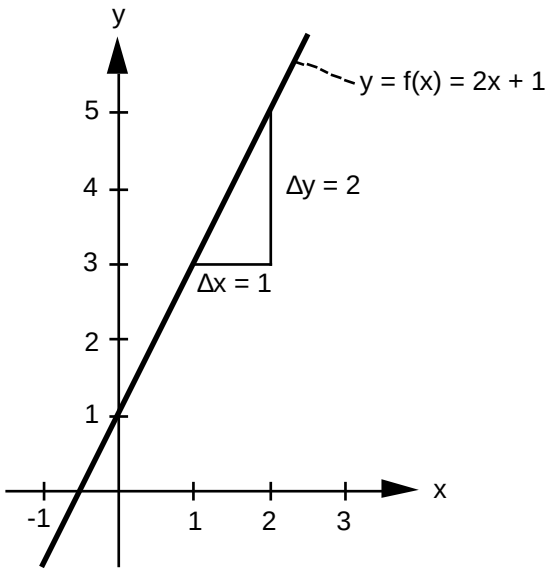


$a = \frac{\Delta y}{\Delta x}$: **slope** special case a = 0: **constant function**

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

Examples

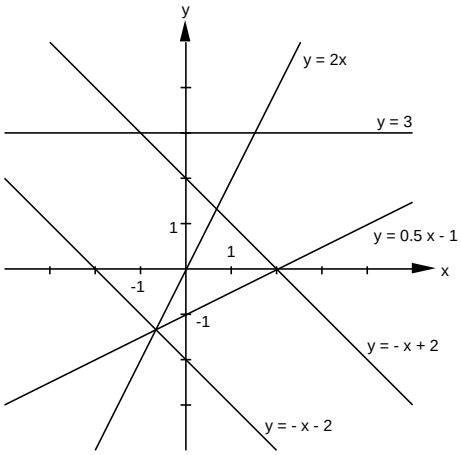
1. f: ℝ → ℝ
   x → y = f(x) = 2x + 1



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

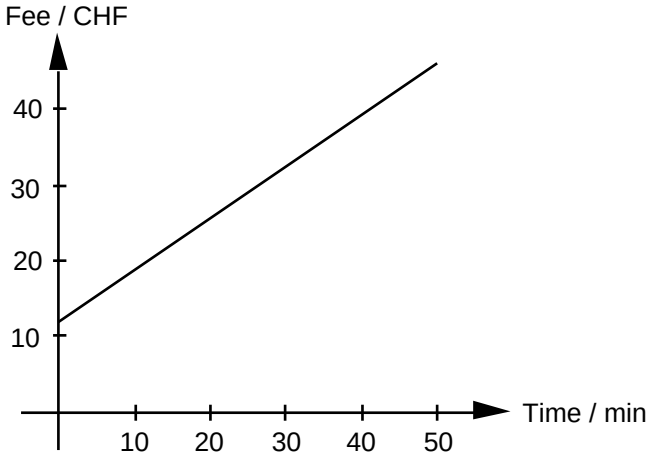
Intercept b = 1

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%