

Four Ways to Represent a Function

Verbally - using a description in words

Numerically - using a table of values

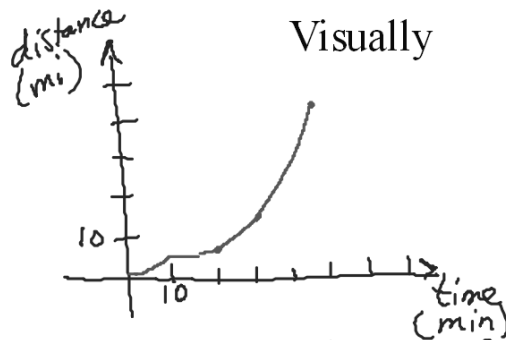
Visually - using a graph

Algebraically - using explicit formulas

Example - The distance traveled in my car on the way to the family farm is a function of how long we have been driving. (Verbally)

Numerically

t	d
20	5
30	12
45	40



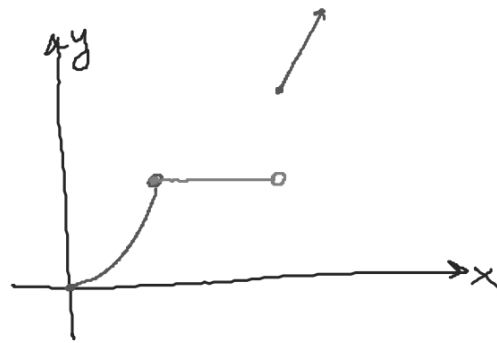
Algebraically

$$d = 0.03t^2 - 0.4/t + 0.28$$

definition of function - for each element of the domain there is a single element of the range assigned to it.

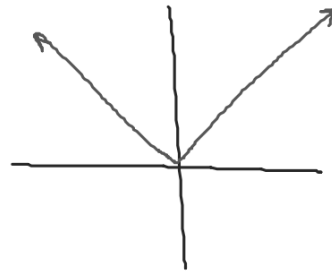
Piecewise-defined functions

$$f(x) = \begin{cases} x^2, & 0 \leq x < 5 \\ 25, & 5 \leq x < 10 \\ 3x+17, & x \geq 10 \end{cases}$$



absolute value - distance from zero

$$|x| = \begin{cases} x, & x \geq 0 \\ -x, & x < 0 \end{cases}$$



Symmetry

with respect to a line

y-axis



even



$$f(-x) = f(x)$$

x-axis



not a function

$$y = x$$

with respect to a point

origin



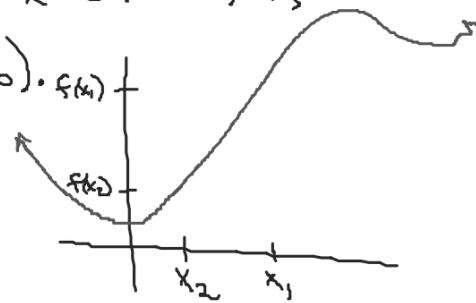
odd



$$f(-x) = -f(x)$$

Special symmetries

Increasing and decreasing If $x_1 > x_2$ and $f(x_1) > f(x_2)$ for all x on (a, b) , then f increases on (a, b) .



Example problems from 1.1, pages 20-23

1, 9, 13, 19, 24, 28, 36, 50, 54, 67