Symmetry properties

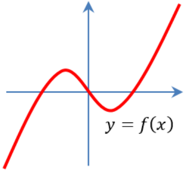
Definition 1.34

A function $f : \mathbb{R} \to \mathbb{R}$ is called

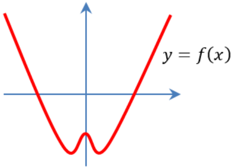
(i) an **odd function** if $f(-x) = -f(x)$ for every $x \in \mathbb{R}$;

(ii) an **even function** if $f(-x) = f(x)$ for every $x \in \mathbb{R}$;

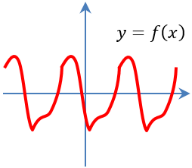
(iii) a **periodic function** if there exists $c > 0$ such that $f(x + c) = f(x)$ for every $x \in \mathbb{R}$. c is called a **period** of f. If there is a smallest such positive number c, then it is called the **fundamental period** of f.



$f : \mathbb{R} \to \mathbb{R}$ is odd

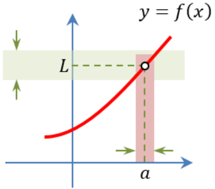


$f : \mathbb{R} \to \mathbb{R}$ is even



$f : \mathbb{R} \to \mathbb{R}$ is periodic

Informal definition of limit



Definition 2.1 (Finite limit at a number)

Let a be a real number and f be a function which is well-defined on an open interval that contains a, except possibly at a. A real number L is called a "**limit** of $f(x)$ as x tends to a" if the number $f(x)$ *gets closer and closer to* L when x *gets closer and closer to* a but $x \neq a$. In symbols we write either

$$f(x) \to L \text{ as } x \to a \qquad \text{or} \qquad \lim_{x \to a} f(x) = L.$$