

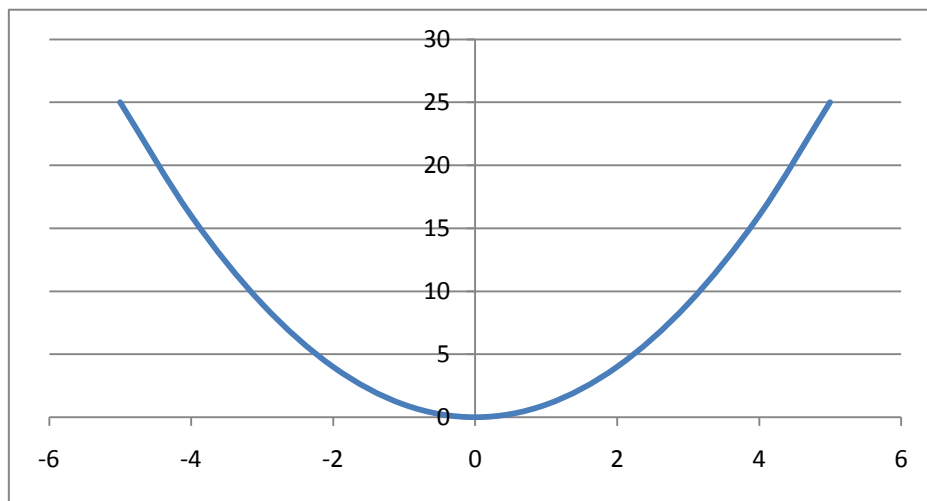
## Even and Odd Functions

Some functions can be classified as *even* or *odd*. This document defines and gives examples of both even and odd functions.

### Even Functions

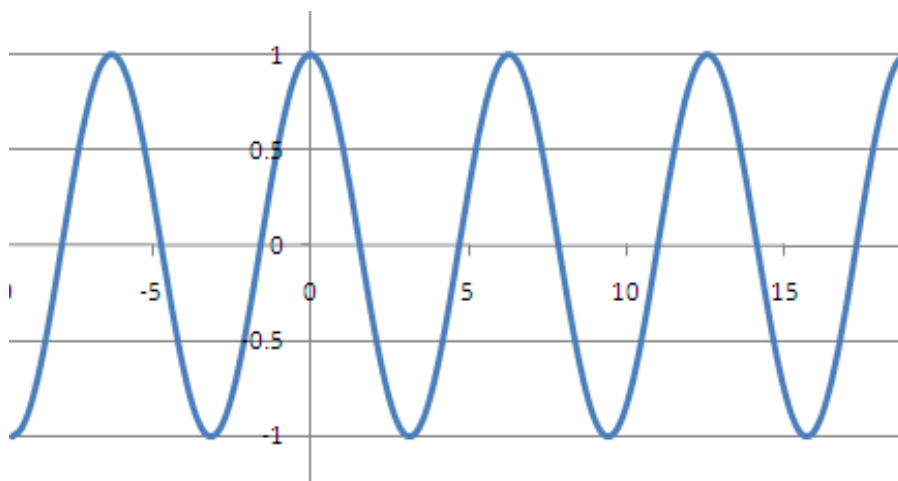
A function  $f(x)$  is said to be *even* if  $f(-x) = f(x)$  for all values of  $x$ ; that is the function is unaffected following its reflection in the  $y$ -axis (the line  $x=0$ ).

For example  $y = x^2$  is an even function.



$$y = x^2$$

For example  $\cos(x)$ <sup>1</sup> is an even function.

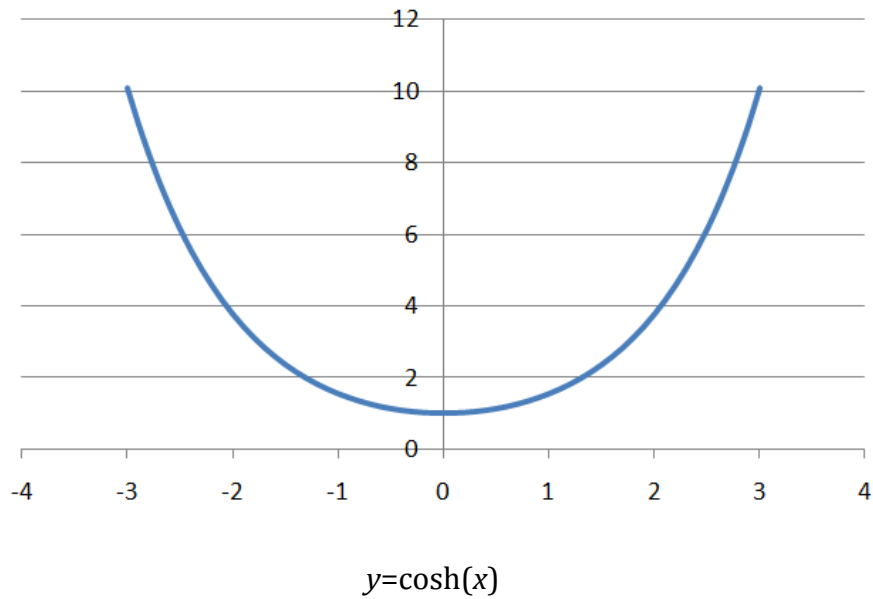


$$y = \cos(x)$$

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<sup>1</sup> [Trigonometric Functions](#)

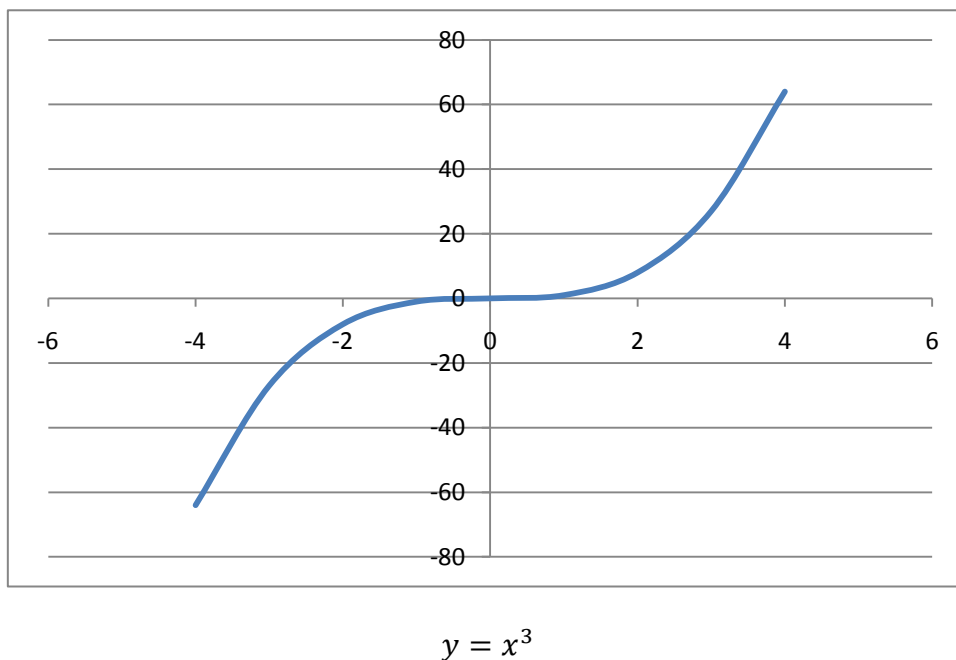
For example  $\cosh(x)^2$  is an even function.



### Odd Functions

A function  $f(x)$  is said to be *odd* if  $f(-x) = -f(x)$  for all values of  $x$ ; that is the function is unaffected following a 180° rotation in the  $y$ -axis (the line  $x=0$ ).

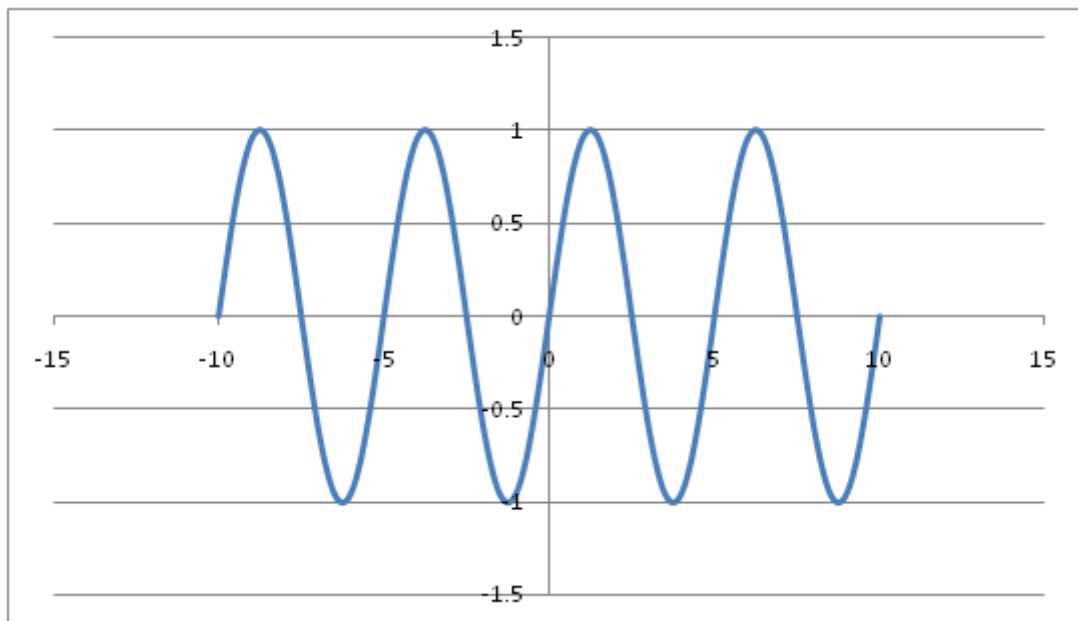
For example  $y = x^3$  is an odd function.



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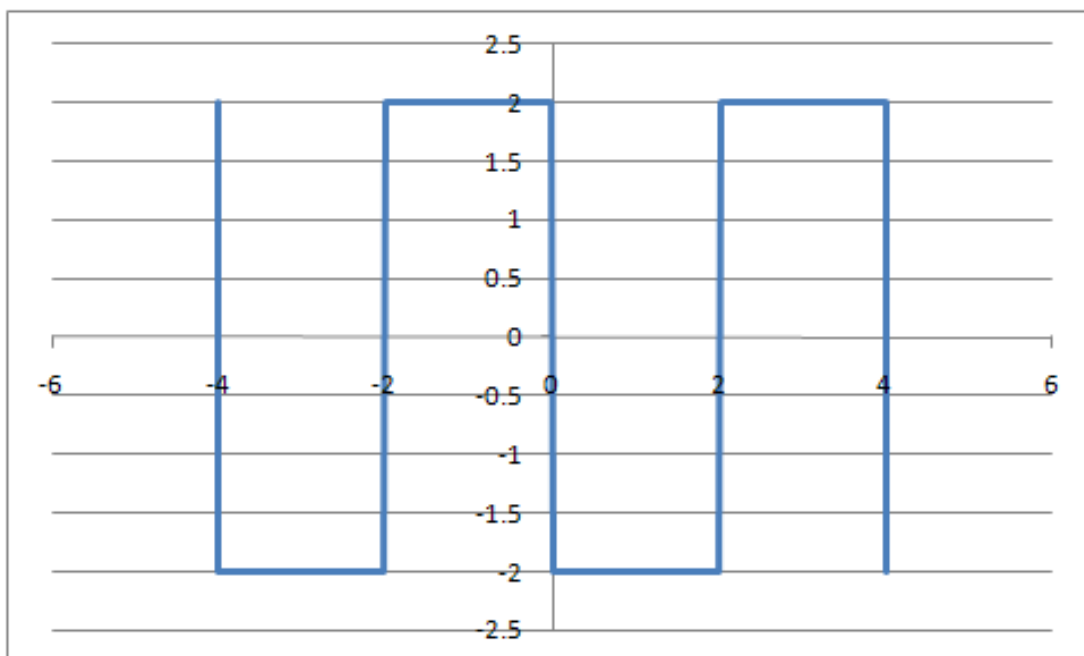
<sup>2</sup> [Hyperbolic Functions](#)

For example  $\sin(x)^3$  is an odd function.



$y = \sin(x)$

For example the following square wave is odd.



Square wave.