19 / 8 / 16

Graphs of Related Functions - Lesson 2

Functional Transformations - Scalings

LI

- Sketch graphs of functions that are scaled either horizontally or vertically.

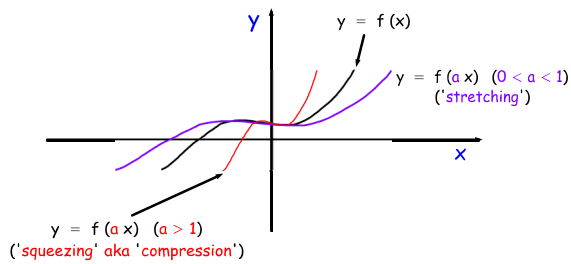
SC

- Sketch graphs of standard functions.

Jan 10-12:11

Scalings (aka Dilatations)

Horizontal scaling (aka x - scaling)



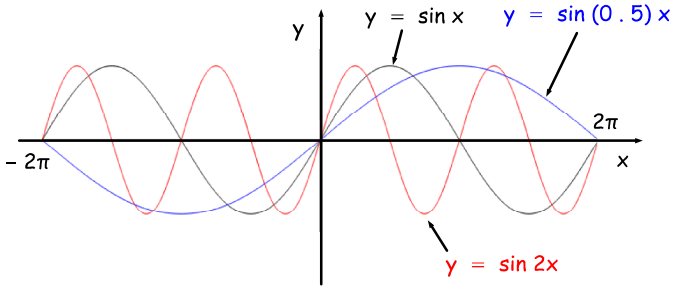
Here, $a > 0$

Point (x, y) goes to point $(x / a, y)$.

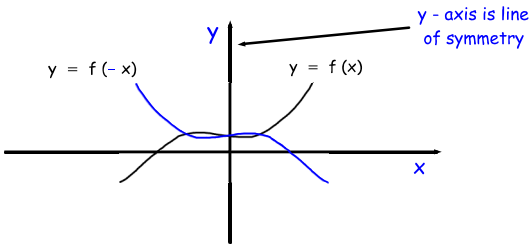
$f(x)$ changes into $f(a x)$.

Example 1

Sketch $y = \sin x$, $y = \sin 2x$ and $y = \sin (0.5) x$
(all between -2π and 2π radians) on the same diagram.

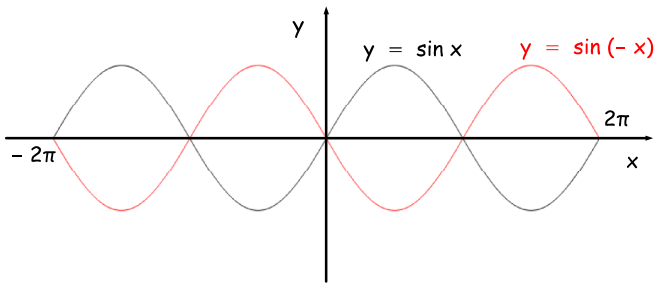


Special Case of x - scaling (a = – 1 : reflection in y - axis)



Example 2

Sketch $y = \sin x$ and $y = \sin (-x)$ on the same diagram
(both between -2π and 2π radians).



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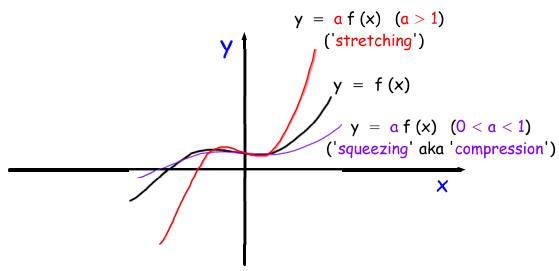
Vertical scaling (aka y - scaling)



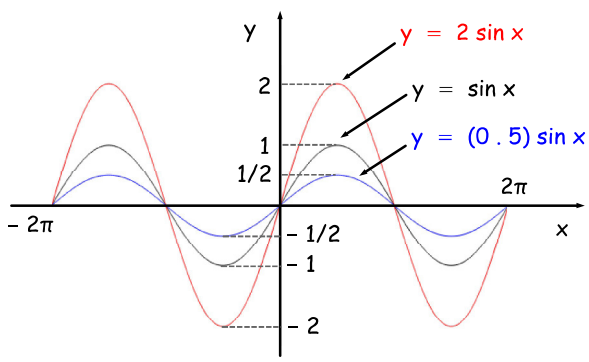
Here, a > 0

Point (x, y) goes to point (x, a y).

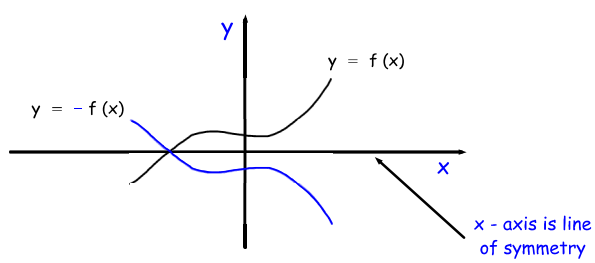
f (x) changes into a f (x).

Example 3

Sketch y = sin x, y = 2 sin x and y = (0 . 5) sin x
on the same diagram (all between − 2π and 2π radians).

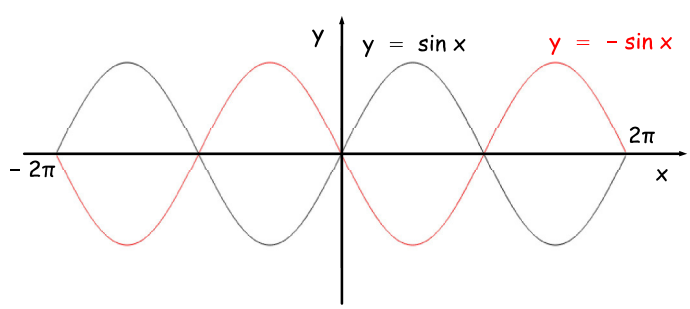


Special Case of y - scaling (a = − 1 : reflection in x - axis)



Example 4

Sketch y = sin x and y = − sin x on the same diagram
(both between − 2π and 2π radians).



Sep 2-10:16

Different Book

Heinemann Higher Maths

y - scalings (reflection)

- pg. 39 Ex. 3F Q 1 - 4
- pg. 40 Ex. 3G Q 1 - 4

x - scalings (reflection)

- pg. 40-41 Ex. 3H Q 1 - 4
- pg. 41-42 Ex. 3I Q 1 - 5

y - scalings

- pg. 42-43 Ex. 3J Q 1 - 5
- pg. 43 Ex. 3K Q 1

x - scalings

- pg. 44 Ex. 3L Q 1 - 5
- pg. 45 Ex. 3M Q 1

Oct 29-09:14