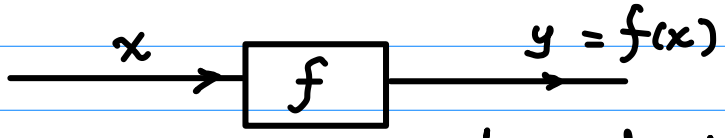
Summary : Functions

Definition

$$y = f(x)$$



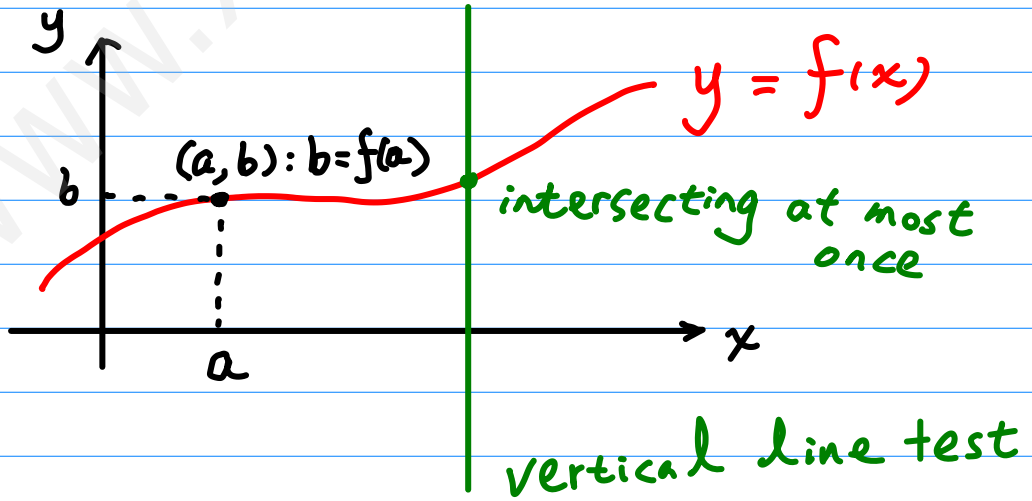
independent variable x — $x \in D$, D: domain

dependent variable y — $y \in R$, R: range

* evaluating $f(x)$
* modeling by $y = f(x)$

Graphs

*



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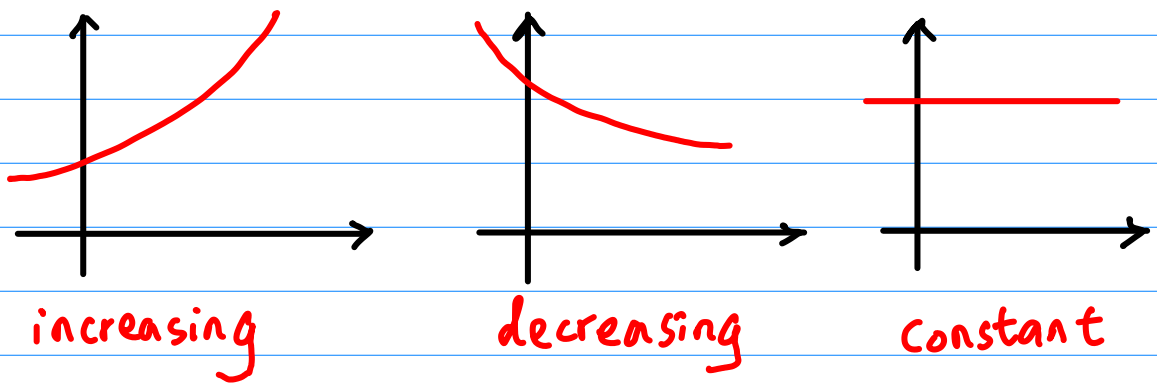

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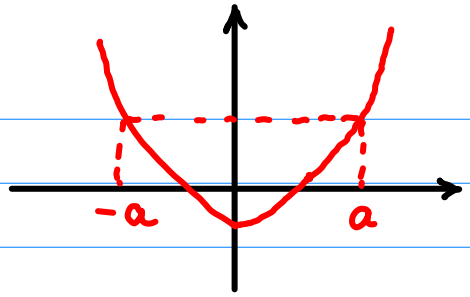
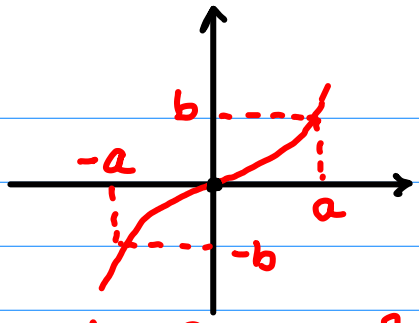
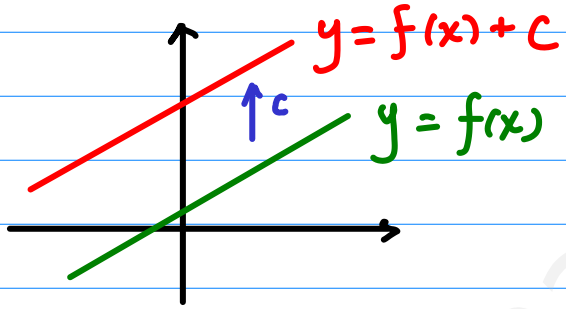


even: $f(-x) = f(x)$

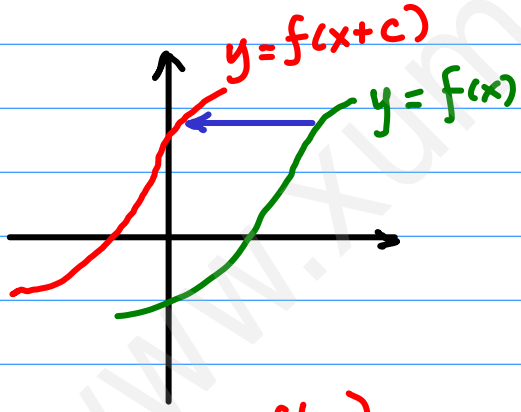


odd: $f(-x) = -f(x)$

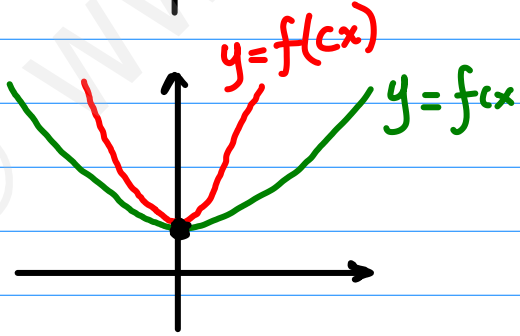
* tansformations



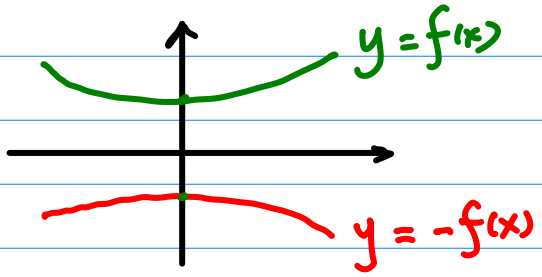
Shift upward by c
(c < 0: downward)



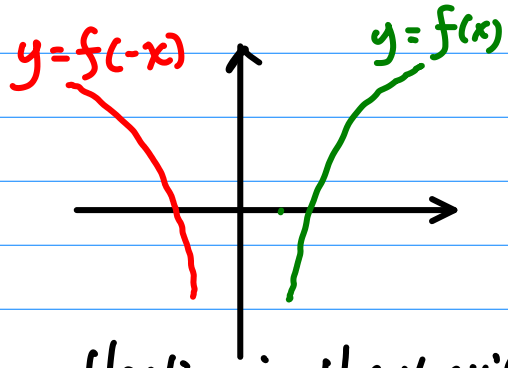
Shift to left by c
(c < 0: to right)



Compress/stretch horizontally
(c > 1: compress
0 < c < 1: stretch)



reflection in the x-axis



reflection in the y-axis

Combinations

* $(f+g)x = f(x) + g(x)$

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

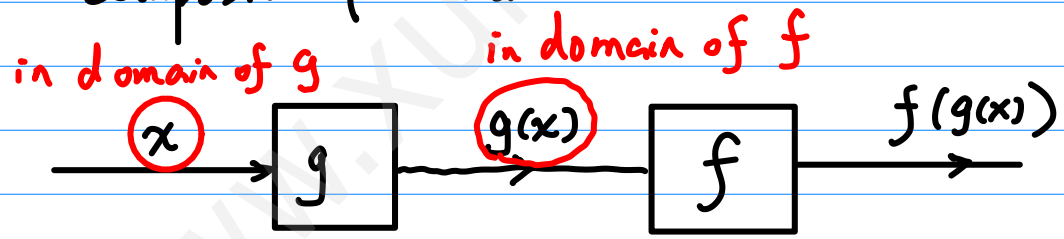
  $(fg)x = f(x) \cdot g(x)$

  $\left(\frac{f}{g}\right)(x) = \frac{f(x)}{g(x)}$

* Composition

  $(f \circ g)(x) = f(g(x))$

  composite function



  - domain of $f(g(x))$: D

    D = subset of domain of g

    such that $g(x) \in$ domain of f for any $x \in D$

  - application of composition