Exp : Example

iff : $\Leftrightarrow$ if and only if

$\forall$: for all

$\exists$: there exist

$\in$: belongs to

Def: definition

Th : Theorem

Q. : Question

A. : Answer

// : Parallel

$\perp$: Perpendicular (normal) (orthogonal)

D: Domain مجال values of x

R: Range مدى values of y

$\mathbb{R}$: Real numbers

D(f) : domain of f

R(f) : range of f

s.t : such that بحيث.

Ch1 : Function

$f(x) = 2x - 1$

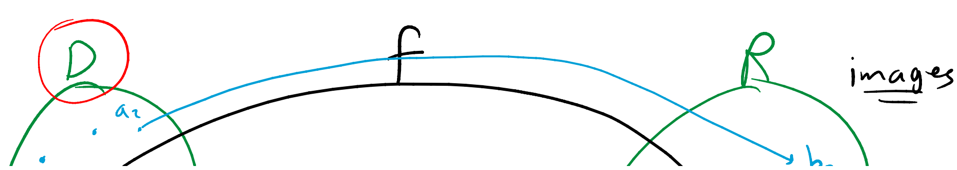
$y = 2x - 1$

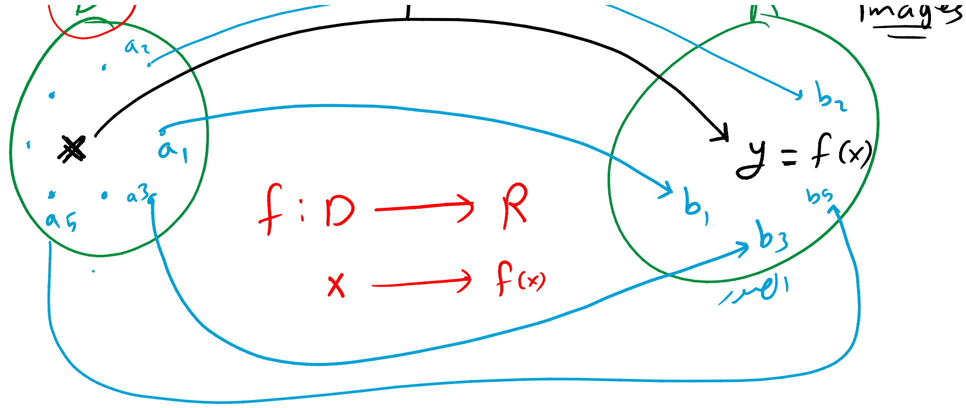
1- مجال = (س)

1- مدى = ص

y ← ص

x ← س





function f is rule from D to R s.t

f assigns to each point $x \in D$ a unique point $y = f(x) \in R$

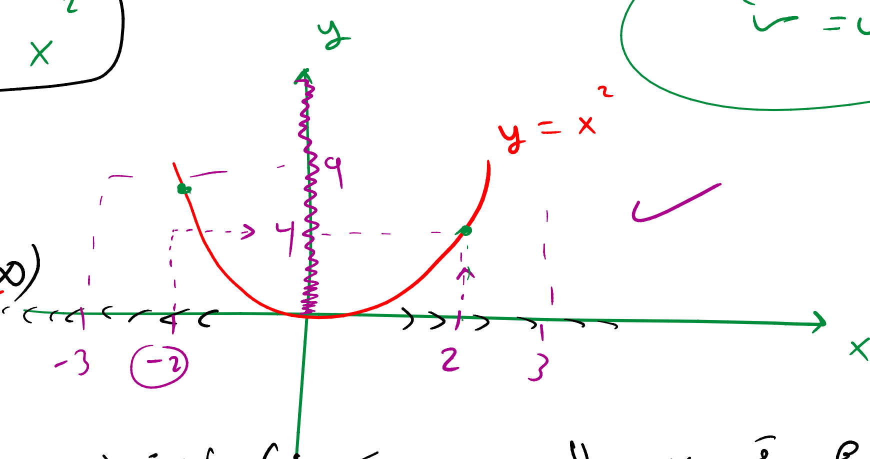
س = ص

Exp $\boxed{f(x) = x^2}$

$y = x^2$ is function

$D(f) = \mathbb{R} = (-\infty, \infty)$

$R(f) = [0, \infty) = \mathbb{R}_0^+$

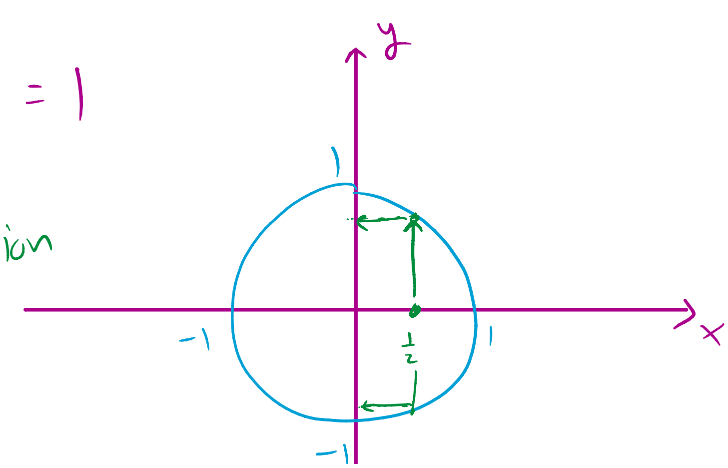


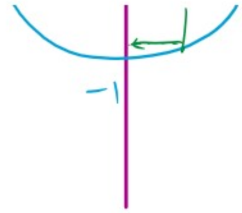
D : ماهي قيم x المسموح تعويضها بالاقتران

R : ماهي قيم y الناتجة عن تعويض قيم x

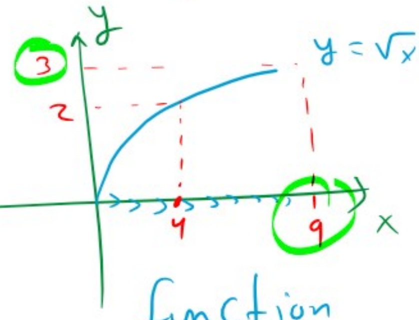
Exp $x^2 + y^2 = 1$

not function





Exp $y = \sqrt{x}$



$D(f) = [0, \infty)$ values of x

$R(f) = [0, \infty)$ values of y

Exp Find $D(f)$ if $f(x) = \sqrt{9 - x^2}$

$9 - x^2 \geq 0 \Rightarrow \sqrt{9} \geq \sqrt{x^2}$

$$\boxed{3 \geq |x|}$$

$$\boxed{|x| \leq 3}$$

$$\boxed{-3 \leq x \leq 3}$$

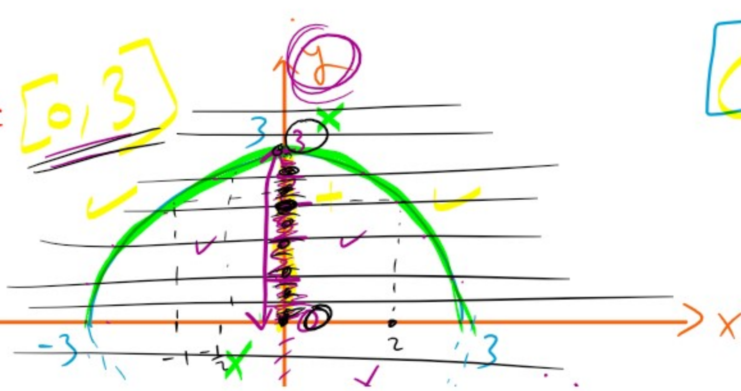
$x = -3$
$x = -2$
$x = -1$
$x = 0, 1, 2, 3$

$D = [-3, 3]$ فترة

~~$D = \{-3, 3\}$~~ عنصرين

$R(f) = [0, 3]$

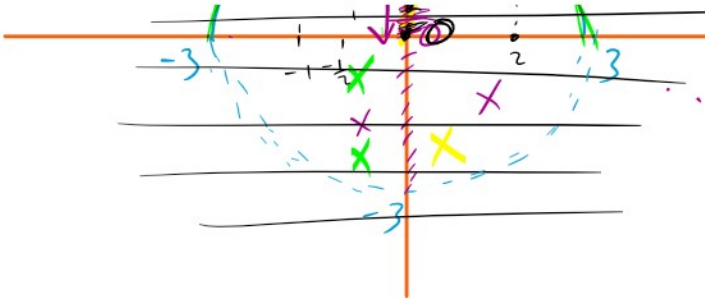
y قيم



$$\boxed{y = \sqrt{9 - x^2}}$$

$y^2 = 9 - x^2$

$x^2 + y^2 = 9$



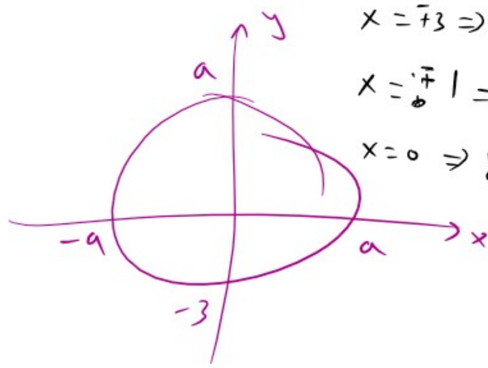
$y = \sqrt{9 - x^2}$

$x \in [-3, 3]$

$x = \mp 3 \Rightarrow y = \sqrt{9-9} = 0$

$x = \mp 1 \Rightarrow y = \sqrt{9-1} = \sqrt{8}$

$x = 0 \Rightarrow y = \sqrt{9} = 3$



$x^2 + y^2 = a^2$

معادلة
دائرة

$|x| = 7 \Rightarrow x = \pm 7$

$|x| = a \Rightarrow x = \{-a, a\}$

$|x| \le 2 \Rightarrow -2 \le x \le 2$

$|4| \le 2$, $|-5| \le 2$, $\Rightarrow \boxed{[-2, 2]}$

$|x| \le c \Rightarrow -c \le x \le c$

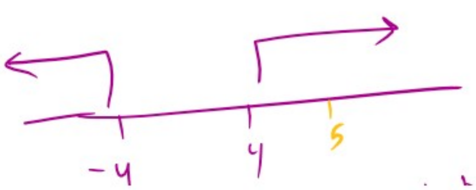
$|x| > 4 \Rightarrow (-4, 4)$

$|3| > 4$

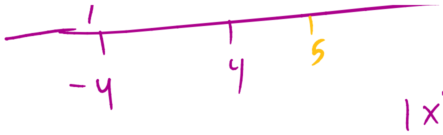
$(4, \infty)$

أو

$(-\infty, -4)$



$|x| > 4 \Rightarrow x > 4$ or $x < -4$



$|x| > 4 \Rightarrow x > 4$ or $x < -4$

$|5| = 5 > 4$

$|-6| = 6 > 4$