$\sin x = 1/2$

$x = \sin^{-1} 1/2$

Inequalities

Basic of Inequality

Inequalities involving

Linear factor

Quadratic factor

Polynomial factor

$\log_3 x = 1/2$ — equation

$(x^2+1)(x-1)$

Logarithmic in

$\log_3 x >$

inequation

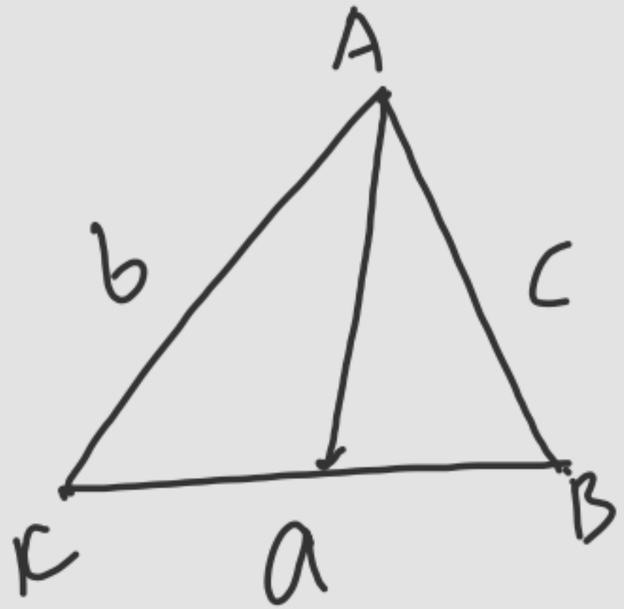
Trigonometric in

$\sin x > 1/2$

Inverse trigono

$\sin^{-1} 1/2 > x$

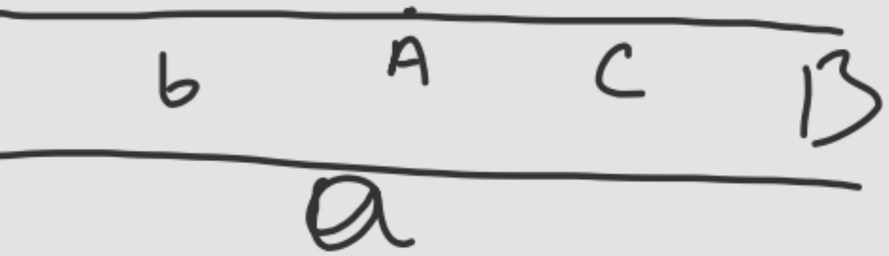
Triangular inequality



$$b + c \geq a$$

$$a + c \geq b$$

$$a + b \geq c$$



$$b + c = a$$

R.M.S - AM - GM inequality

Cauchy - Swarth inq

Chebyshev inq

Holder's minkowski inq

} RMO, IMO, SFO

Intervals

$x + 4 = 5 \Rightarrow x = +1$

$x + 4 > 5 \Rightarrow x > 1$

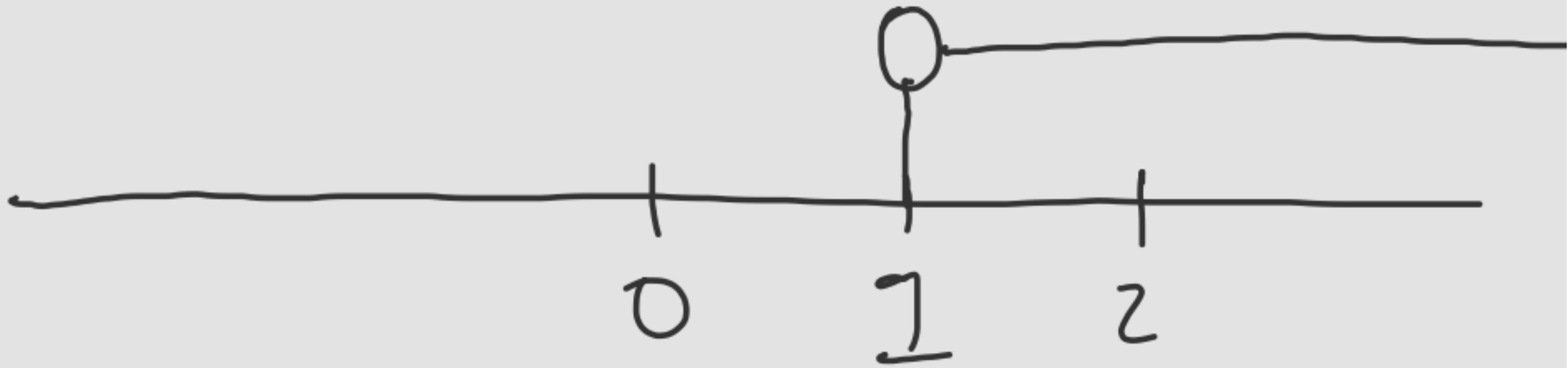
$9 > 5$

● → inc

○ → ex

$x = 5$

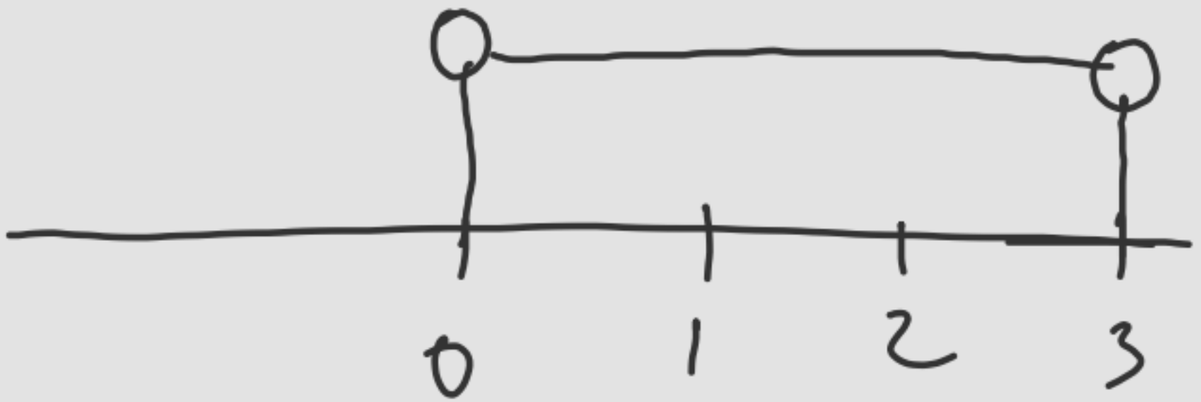
$x = -1$

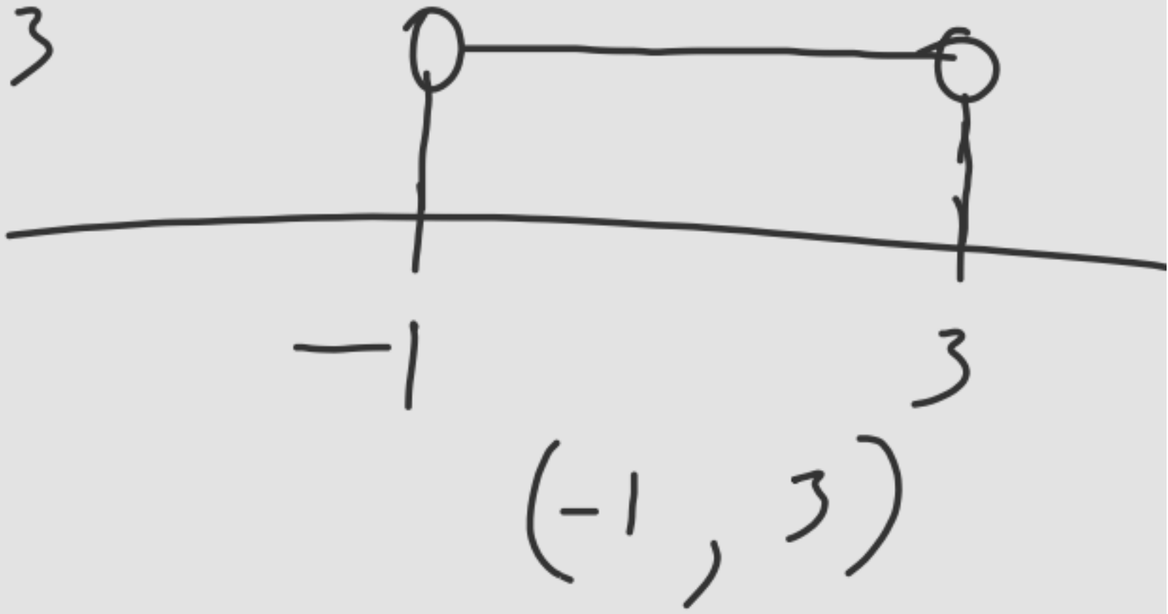


) Open intervals

$(0, 3)$ → all the no

- b/w 0 to 3 excluding 0 and 3

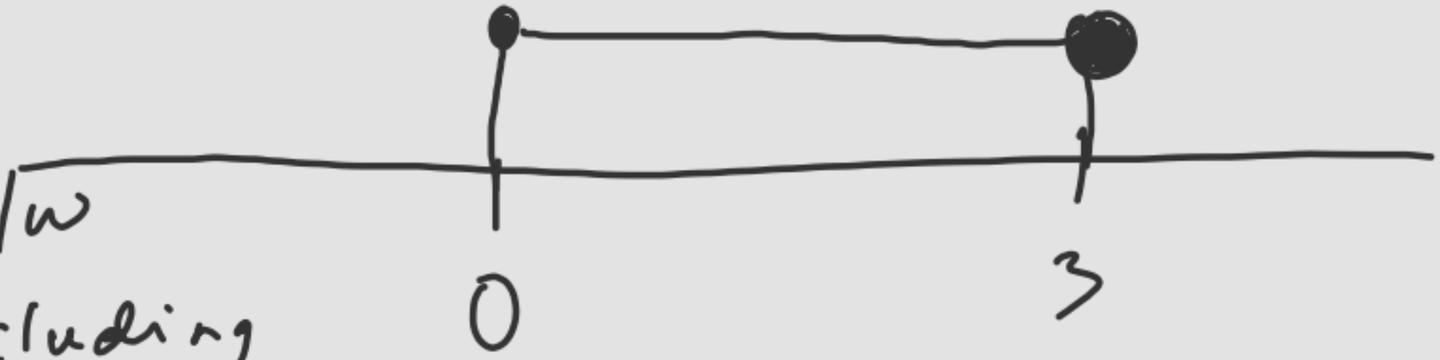




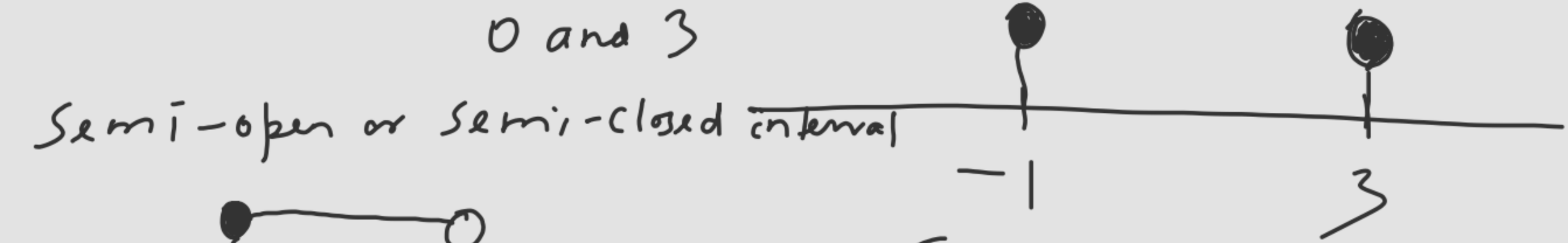
$(-1, 3)$

Closed interval

$[0, 3]$ → all the no b/w 0 to 3 including 0 and 3



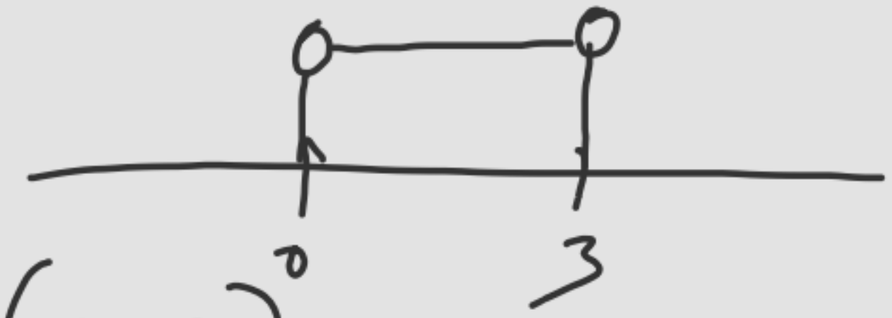
Semi-open or semi-closed interval

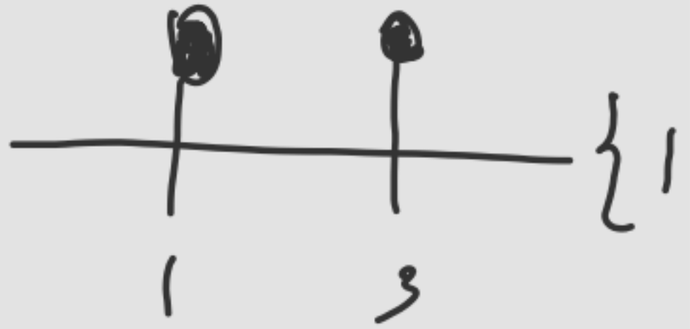


$[0, 3) \equiv]0, 3[$

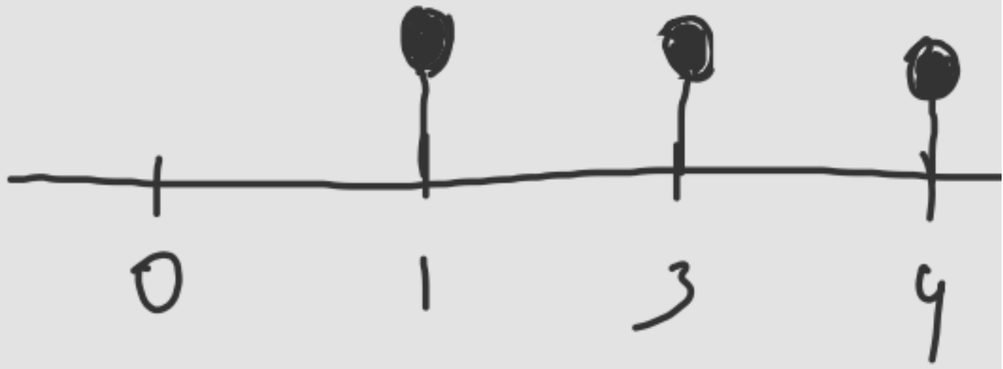
$[-1, 3]$

$]0,3[\equiv (0,3)^{\circ}$





$N = \{0, 3, 4\}$



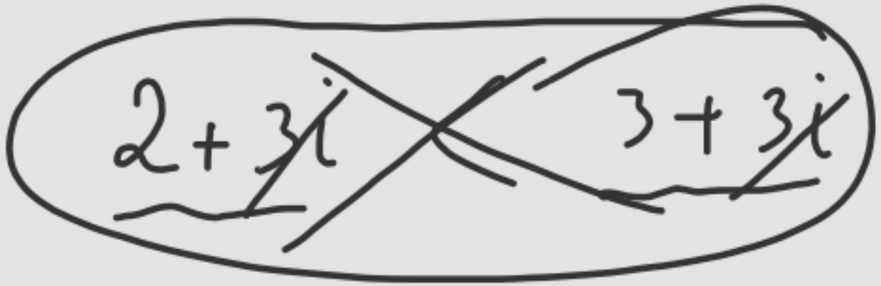
$\{1, 3, 4\}$

$2 < 5$

$\sqrt{5} > 2$

$x^2+1 > x^2$

$x^2-4 < x^2$



$> < \geq \leq$

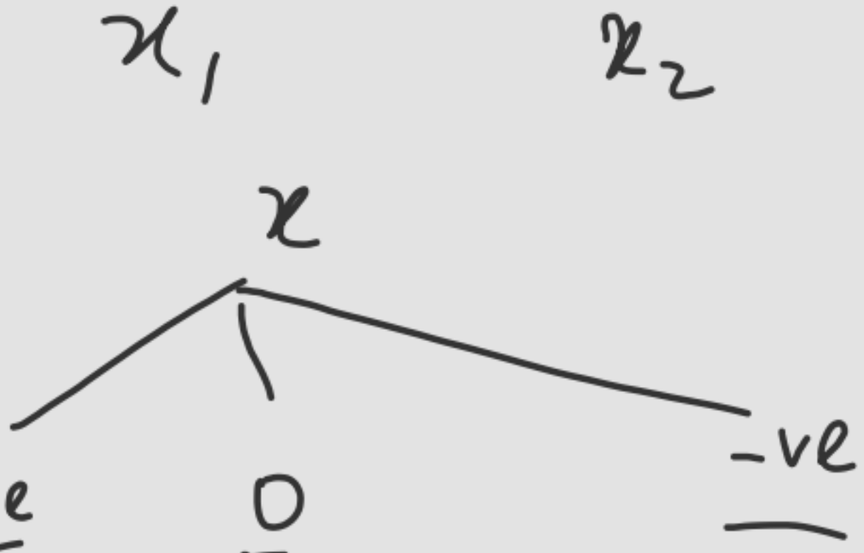
All the real have a very beautiful property that it can comp

Law of trichomtomy

$x_1 > x_2 \rightarrow x_1$ is greater than x_2

$x_1 < x_2 \rightarrow x_1$ is less than x_2 +ve

$x_1 = x_2 \rightarrow x_1$ is equal to x_2



$-2 > -5$

$5 > 3$

} numerical inequality

ict $\begin{cases} x^2+1 > x^2 \\ x^2+y^2+1 > 0 \end{cases}$ qu

$x^2+y^2 \geq 2xy$ s

$x^2 \geq 0$ } in

Properties of Inequalities

$x > 0$ & $y > 0$

or

$x < 0$ & $y < 0$

$xy > 0$

Both are +ve

Both are -ve

...

$x > 0$ & $y < 0$

or

$x < 0$ & $y > 0$

Combinedly

$xy < 0$

$+ \times - = -$

$- \times + = -$

$a > b$
$c > d$

4 > 2
3 > 1
7 7 3

$a = b$
$c = d$

$a + c = b + d$

$a + c > b + d$ (True)

$a - c = b - d$

$a - c > b - d$ (false)

$ac = bd$

$ac > bd$ (false)

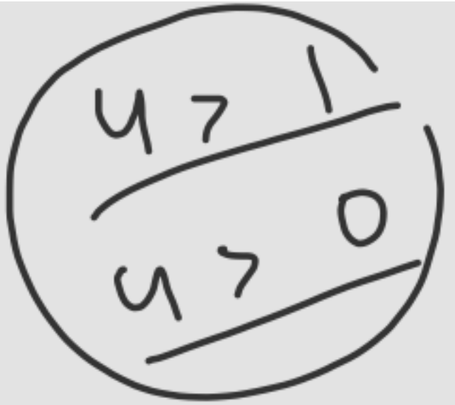
$\frac{a}{c} = \frac{b}{d}$ {c ≠ d ≠

$\frac{a}{c} > \frac{b}{d}$ (false)

$a > b$
$c > d$

$a - c > b - d$

$ac > bd$



$0 > 1$

$y > 2$

$-y > -6$

$-16 < -12$

$a > b > 0$

$c > d > 0$

$2 > 1 > 0$

a) $a + c > b + d$ (True)

b) $a - c > b - d$ (false)

c) $ac > bd$ (True)

d) $\frac{a}{c} > \frac{b}{d}$ (false)

$1 < 2$