Continuity सतता →

IPL
2008 — 2024
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WW-2
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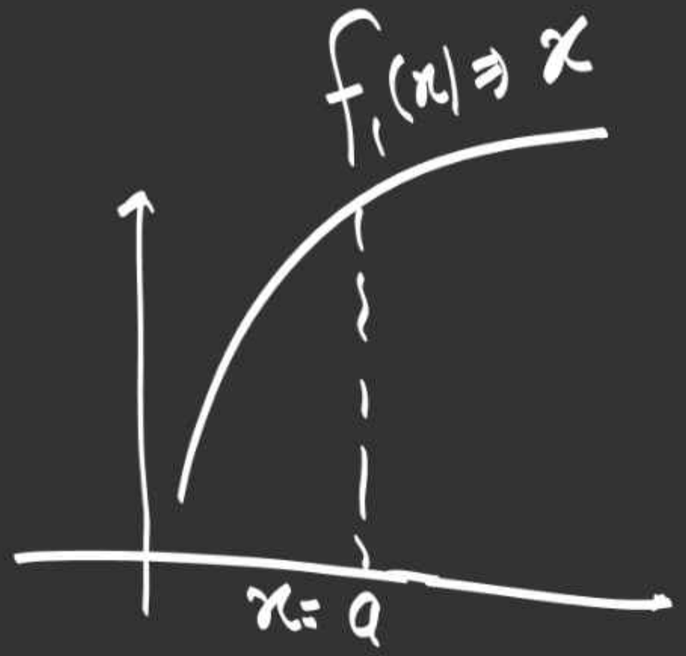
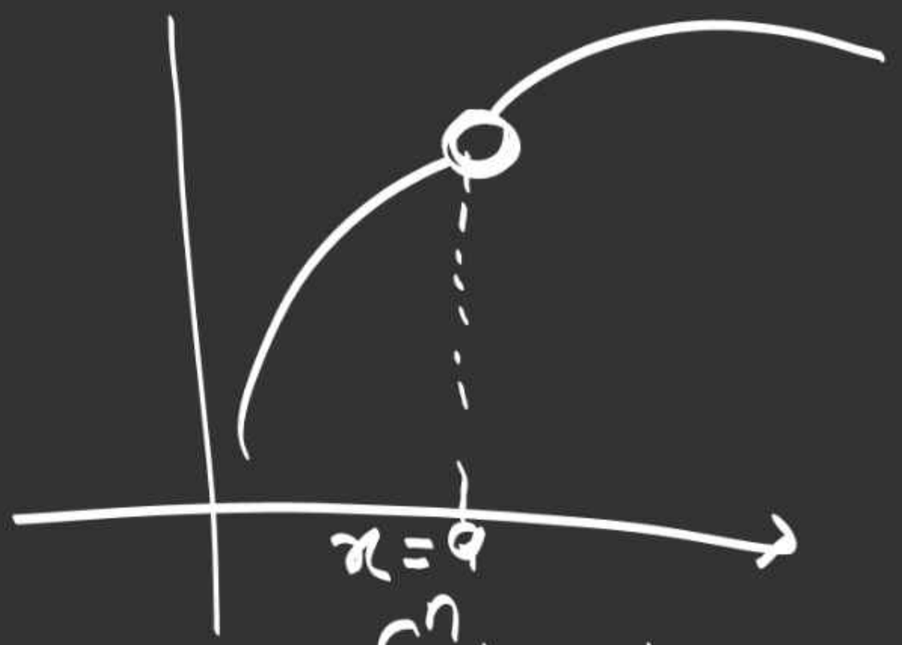
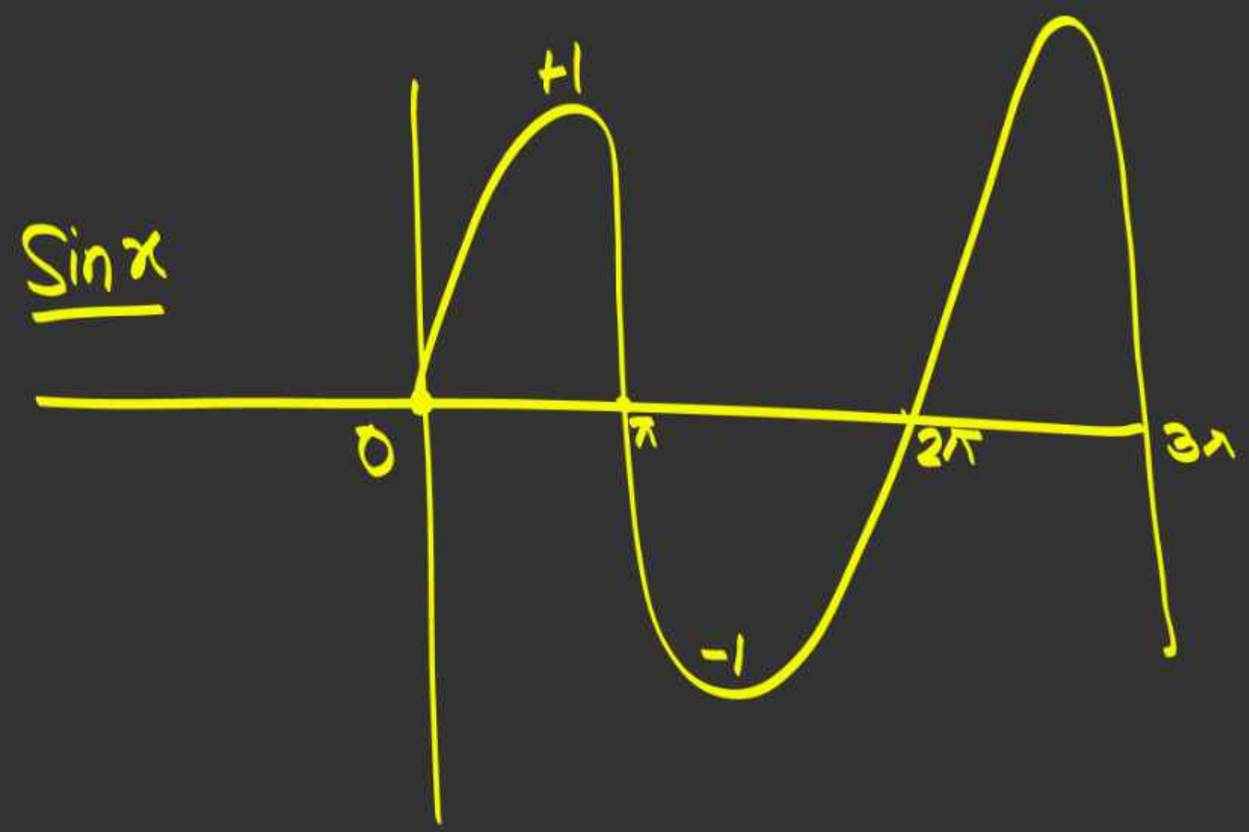
Break



f^n is Continuous



f^n is not Continuous


Sin x
+1
0
π
2π
3π
-1

T
Trignometric
f^n

A
Algabric
f^n

L
Log
f^n

E
Exponential
f^n

Continuity of Algebraic f^n

(i) Polynomial f^n (बहुपद फलन) → are Continuous at all $x \in R$

(Continue Everywhere f^n)

- $f(x) = a_0 + a_1x + a_2x^2 + a_3x^3 + \cdots\cdots$
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- $f(x) = a_0 + a_1x + a_2x^2 + a_3x^3 + \cdots\cdots$
- $f(x) = a_0 + a_1x + a_2x^2 + a_3x^3 + \cdots\cdots$

$f(x) \Rightarrow a_0$ Constant f^n

$f(x) \Rightarrow a_0 + a_1 x \Rightarrow$ Linear f^n $(ax+b)$

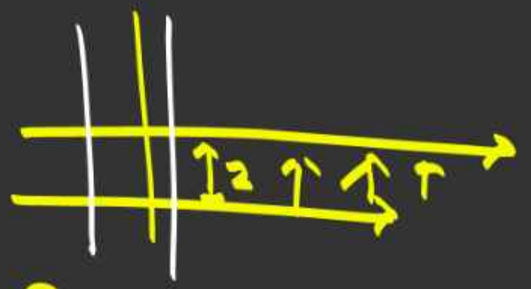
$f(x) \Rightarrow a_0 + a_1 x + a_2 x^2 \rightarrow$ qudratic f^n (ax^2+bx+c)

$f(x) \Rightarrow a_0 + a_1 x + a_2 x^2 + a_3 x^3 \rightarrow$ Cubic $f^n (ax^3+bx^2+cx+d)$

R = Real No

Constant f^n

$f(x) = 2$



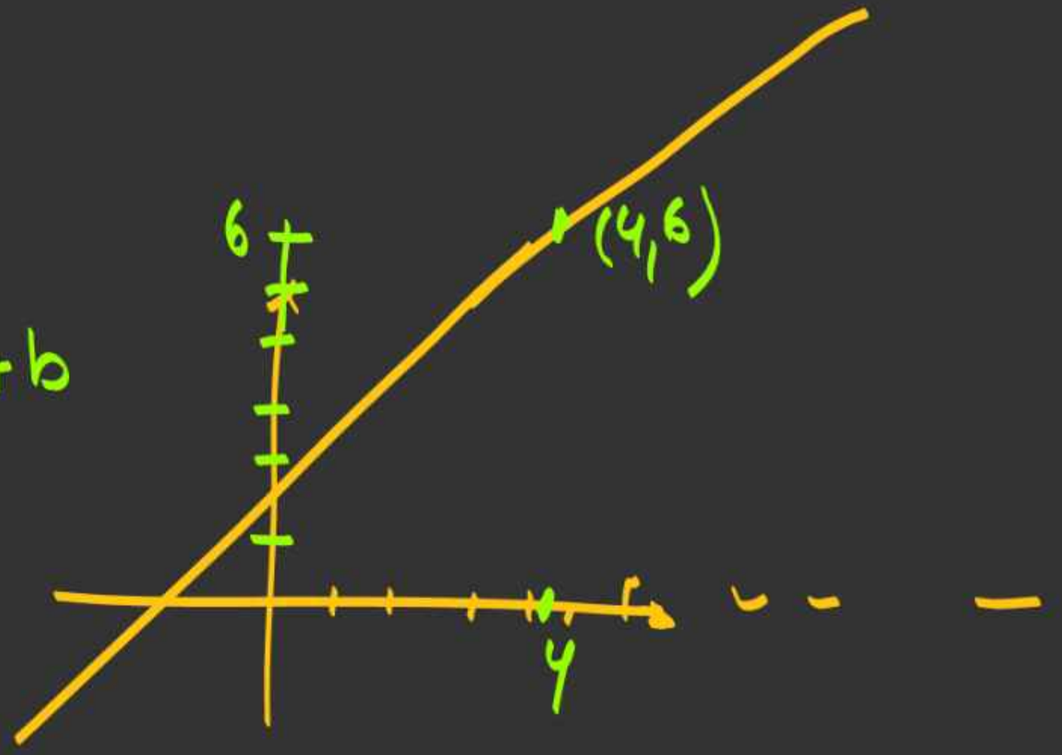
(set of values of x) → Domain → R

(set of values of y) → Ronge → R

The f^n is continuous at all $x \in R$

Linear f^n → $f(x) = ax + b$

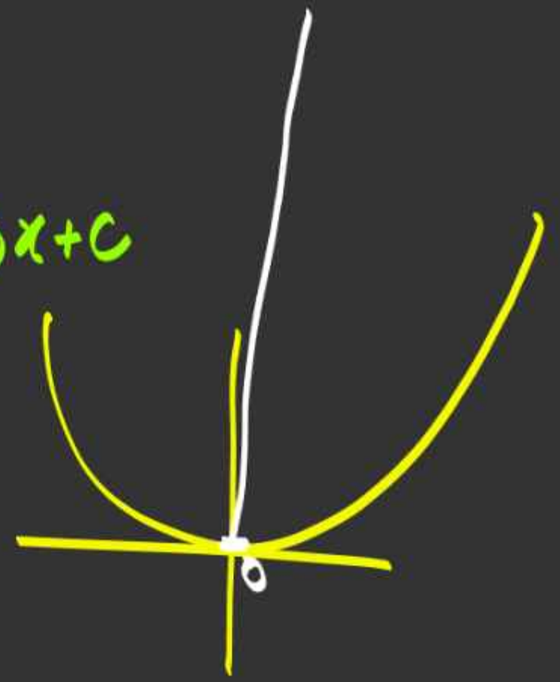
$y = mx + c$



- Domain → R
- Range → R

Liner f^n are continuous at all $x \in R$

Quadratic f^n ⇒ $f(x) = ax^2 + bx + c$



Domain → R

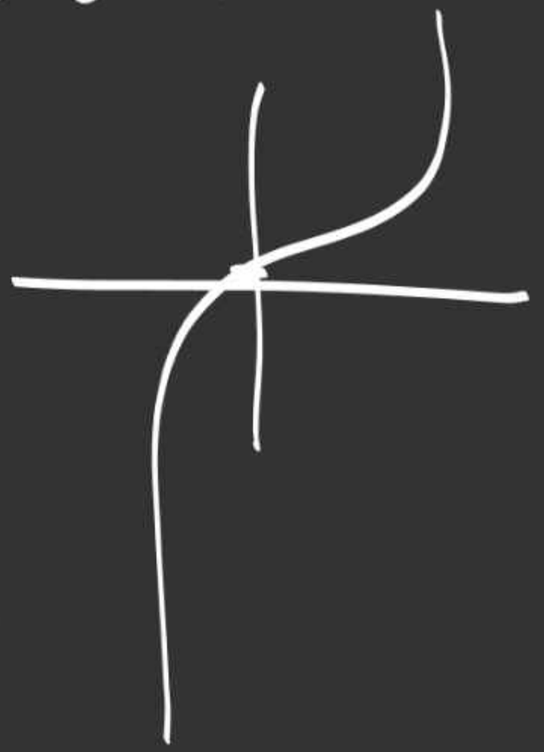
Range → $(0, \infty)$

Cubic f^n $\Rightarrow$ $f(x) = ax^3 + bx + c$

Domain $\rightarrow$ R

Range $\rightarrow$ R

Continuous at all $x \in R$



② Rational f^n (परिमेय फलन) :-

$$f(x) = \frac{g(x)}{h(x)} \quad \begin{matrix} g(x) \to \text{Poly} \\ h(x) \to \text{Poly} \end{matrix}$$

$$f(x) = \frac{(x+6)}{x^2-4}$$

$$\Rightarrow \frac{(x+6)}{(x+2)(x-2)}$$

$f(x)$ is continuous at all $x \in R - \{x ; h(x) \neq 2\}$

$f(x) = \frac{g(x)}{h(x)}$ is Continuous at all $x \in R - \{x ; h(x) = -4\}$

$$f(x) = \frac{(x^2+4) \to P}{(x+4) \to P} \circ$$

$f(x) = \begin{cases} 2x+3 & x<0 \\ 3 & x=0 \\ 3x^2+4x-3 & x>0 \end{cases}$

is the f^n Continuous or not?

At point $x=0$

LHS	at point	RHS
$2x+3$	3	$3x^2+4x-3$
$2\times0+3$	3	$3\times0^2+4\times0-3$

$$3 = 3 \neq -3$$

The f^n is not Continuous.

$f(x) = \begin{cases} 2x^2-3x+1 & x<1 \\ 2x^2+4 & x \geq 1 \end{cases}$ is function Cont. or not?

at pt $x=1$

LHS	At point	RHS
$2x^2-3x+1$	$2x^2+4$	$2x^2+4$
$2\cdot 3+1$	$2+4$	$2+4$
$3-3$		
0	6	6

$0 \neq 6 = 6$

The fun^n is not continuous

$f(x) = \begin{cases} 3x^2+4x+5 & x<1 \\ 9x+3 & x=1 \\ 4x^2+2x+4 & x>1 \end{cases}$

At point $x=1$ is the f^n cont. or not?

LHS = At point = RHS

$3x^2+4x+5$ $\quad 9x+3$ $\quad 4x^2+2x+4$

$3+4+5$ - $\quad 9+3$ - $\quad 10$

$12 = 12 \neq 10$

This f^n is not Continuous.

$$\#\ f(x)=\begin{cases} x^2+2x+3 & x<2 \\ x^3+3 & x=2 \\ 4x^2+2x-9 & x>2 \end{cases}$$

f^n is Cont. or not Cont?

At pt $x=2$

LHS	At point	RHS
x^2+2x+3	x^3+3	$4x^2+2x-9$
$4+4+3$	$8+3$	$4\cdot4+2\cdot2-9$
11	11	11

$\therefore$ The f^n is Cont.