

AOD

Increasing & Decreasing Function:-

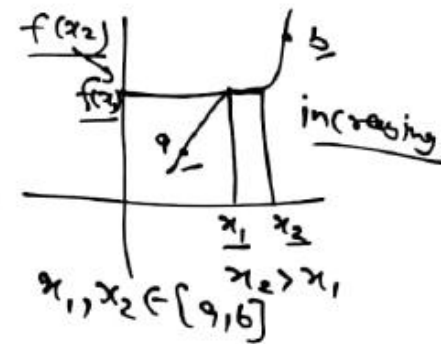
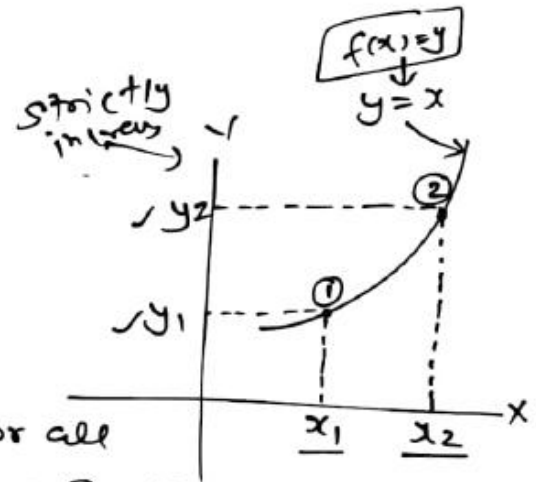
① Increasing function:-

a) if $x_2 > x_1 \Rightarrow f(x_2) > f(x_1)$ or $y_2 > y_1$,

Then the fun. is called strictly increasing fun. for all

b) if $x_2 > x_1 \Rightarrow f(x_2) > f(x_1)$ for all $x_1, x_2 \in [a, b]$

Then || increasing function.



$f(x_2) > f(x_1)$

A O D

Increasing & Decreasing function:-

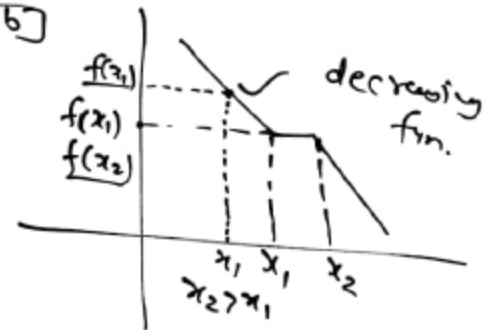
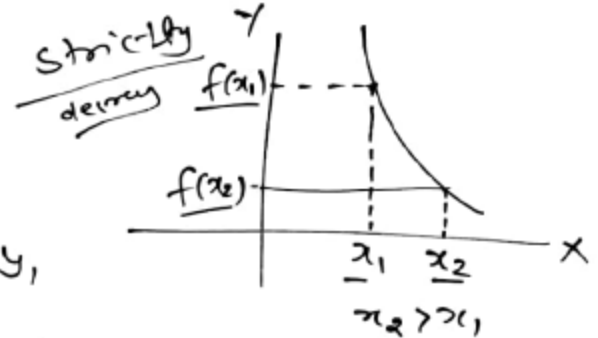
① Decreasing function:-

a) if $x_2 > x_1 \Rightarrow f(x_2) < f(x_1)$ or $y_2 < y_1$

Then the fun. is called Strictly decreasing fun. for all $x_1, x_2 \in [a, b]$

b) if $x_2 > x_1 \Rightarrow f(x_2) \leq f(x_1)$ for all $x_1, x_2 \in [a, b]$

Then ——— || ——— called decreasing function.



AOD

Increasing & Decreasing Function:-

Ex:- Check whether the fun. $f(x) = 3x + 2$ is incr. or decreasing. ?

Sol:- Let $x_2 > x_1$

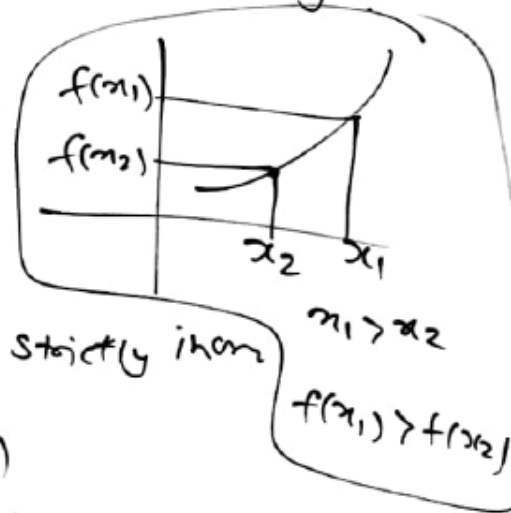
For increasing fun. \rightarrow if $x_2 > x_1 \Rightarrow f(x_2) > f(x_1)$

multiply by 3 $\rightarrow 3x_2 > 3x_1$

add 2 $\rightarrow 3x_2 + 2 > 3x_1 + 2$

$f(x_2) > f(x_1)$

\rightarrow strictly inc



or $x_1 > x_2$

$3x_1 > 3x_2$

$3x_1 + 2 > 3x_2 + 2$

$f(x_1) > f(x_2)$

$x_2 > x_1 \Rightarrow f(x_2) > f(x_1)$

$x_1 > x_2 \Rightarrow f(x_1) > f(x_2)$

A O D

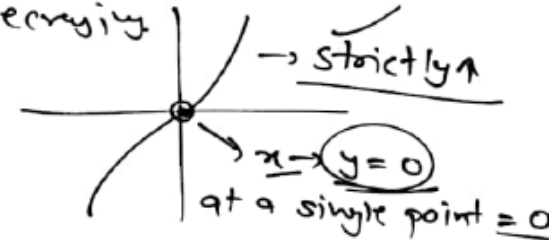
Increasing & Decreasing function:-

by using Diff / Derivative:- for a fun. $f(x)$

i) if $f'(x) \geq 0$ then the fun. is always strictly increasing.

ii) if $f'(x) \leq 0$ then the fun. is always strictly decreasing.

φ $0 = (a, b)$ interval



Ex:- $y = f(x) = x^2 + 2 \rightarrow$ (increasing) or decreasing.

solⁿ $\therefore f(x) = x^2 + 2$

$\therefore f'(x) = 2x$

Here $f'(x) > 0$

so

$x \in [0, 5]$

$f'(x) \geq 0$

