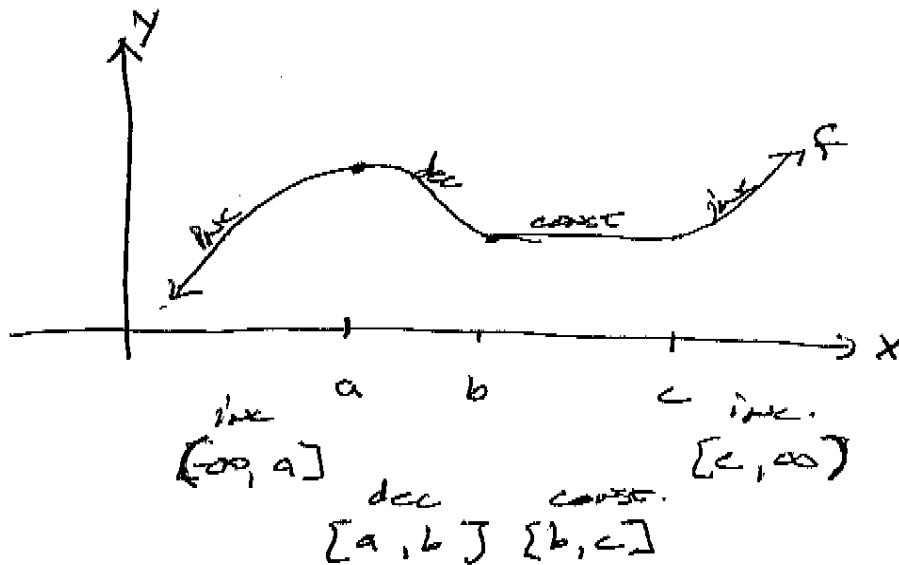


2.3: Average Rate of Change

2.3
1/3

Two topics in this section.

I: Increasing & decreasing fcts.



NOTE: A fct can be both inc. & dec
@ a point (by this def).

Definition: If f is cont. on some
interval I ...

f is increasing on I if $x_1 < x_2$ in $I \Rightarrow f(x_1) < f(x_2)$

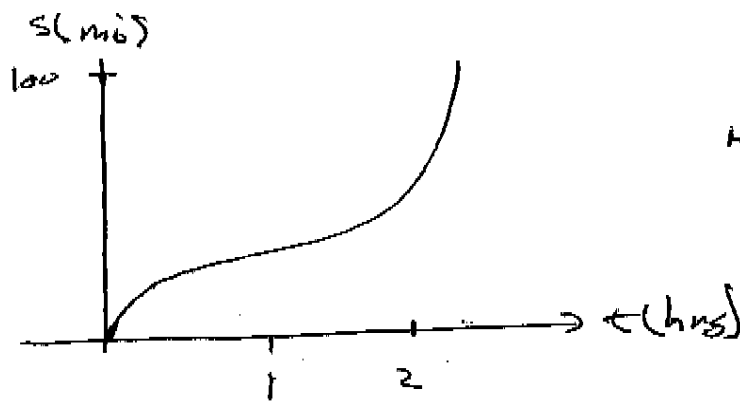
f is dec on I if $x_1 < x_2$ in $I \Rightarrow f(x_1) > f(x_2)$

Ex1: Find inc, dec, const, max, min, sign chart
zeros, D & R of an arb. fct.

2.3
2/3

II: Average ROC

Ex 2: Average speed.



NOTE: Where do we go slowly?

a) average speed for the drive

b) " " over various intervals

Definition: Average ROC

The average ROC of f on the const. interval $[a, b]$ is

$$\text{Ave ROC} = \frac{\text{change in } y}{\text{change in } x} = \frac{\Delta y}{\Delta x} = \frac{f(b) - f(a)}{b - a}$$

Q: where have we seen a similar formula?

↳ show the secant line.

Ex 3: Find the Ave ROC of $f(x) = (x+2)^2$ on

a) $-4 \leq x \leq 0$ and b) $0 \leq x \leq 4$

2.3
3/3

Ex 4: Find the Ave. speed of an object that falls off "Steel Bridge" in m/s if the distance fallen after t seconds is $d(t) = 5t^2$.

a) or $2 \leq t \leq 5$

b) or $a \leq t \leq a+h$ (draw the pic).

NOTE The relationship between the ave. vel & the fact being six or dec.

Ex 5: Find the Ave Vel of a linear fct.