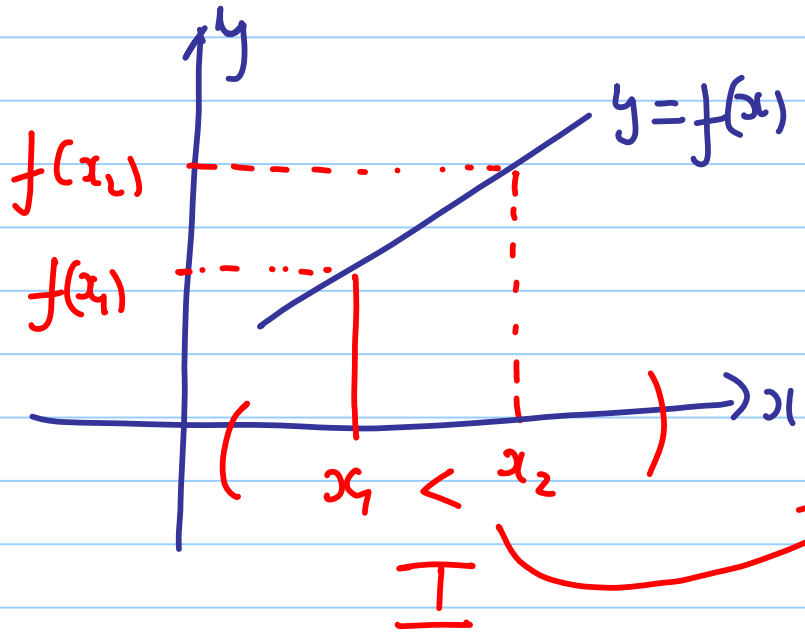
September 17, 2010

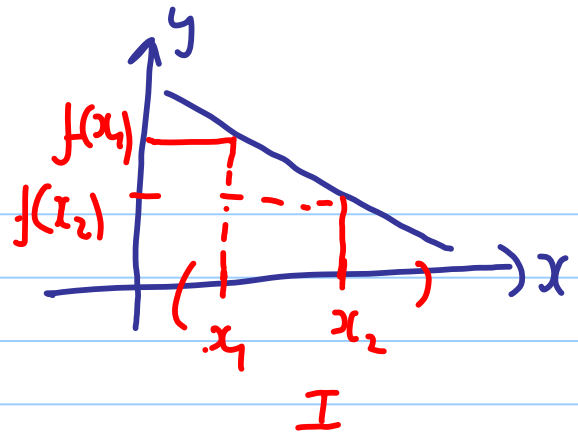
Note Title 9/17/2010

## §3.2 Increasing, decreasing, Constant functions.




$f(x_1) < f(x_2)$

Increasing function




Decreasing function.

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

$x_1 < x_2$

## Example 2

**Domain:** $[-5, \infty)$

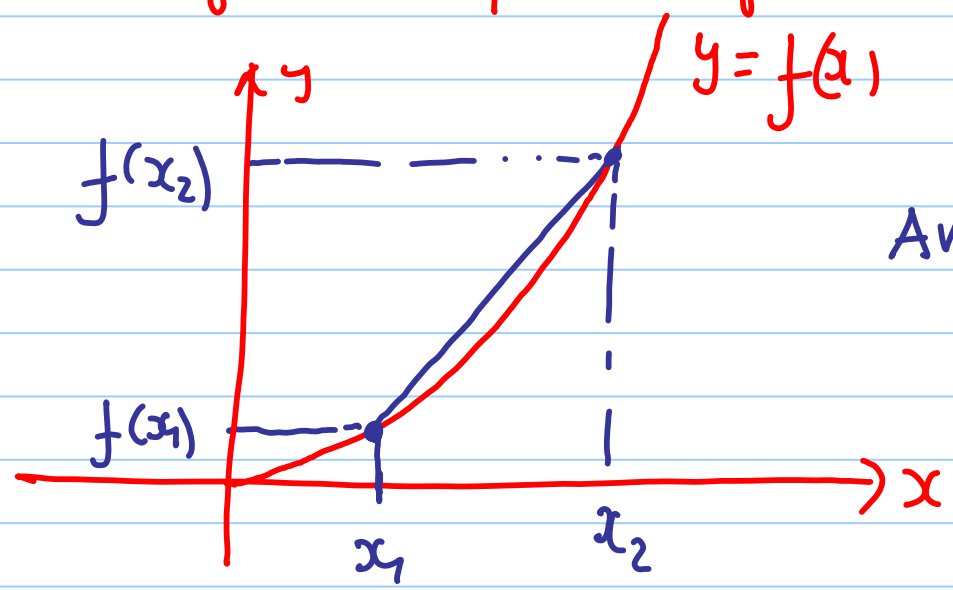
Range: $[0, \infty)$

Increasing: $[2, \infty)$

Constant: $[-2, 0]$

decreasing: $[-5, -2] \cup [0, 2]$

# Average rate of change




Average rate of change

$$= \frac{f(x_2) - f(x_1)}{x_2 - x_1}$$

= Slope of line through the two points.

## Example 3

$f(x) = x^4$

a) $x = -1$ to $x = 0$

$$\text{a.r.o.c} = \frac{f(0) - f(-1)}{0 - (-1)}$$

$$= \frac{0^4 - (-1)^4}{0 + 1}$$

$$= \frac{-1}{1} = -1$$

b) from $x=0$ to $x=1$

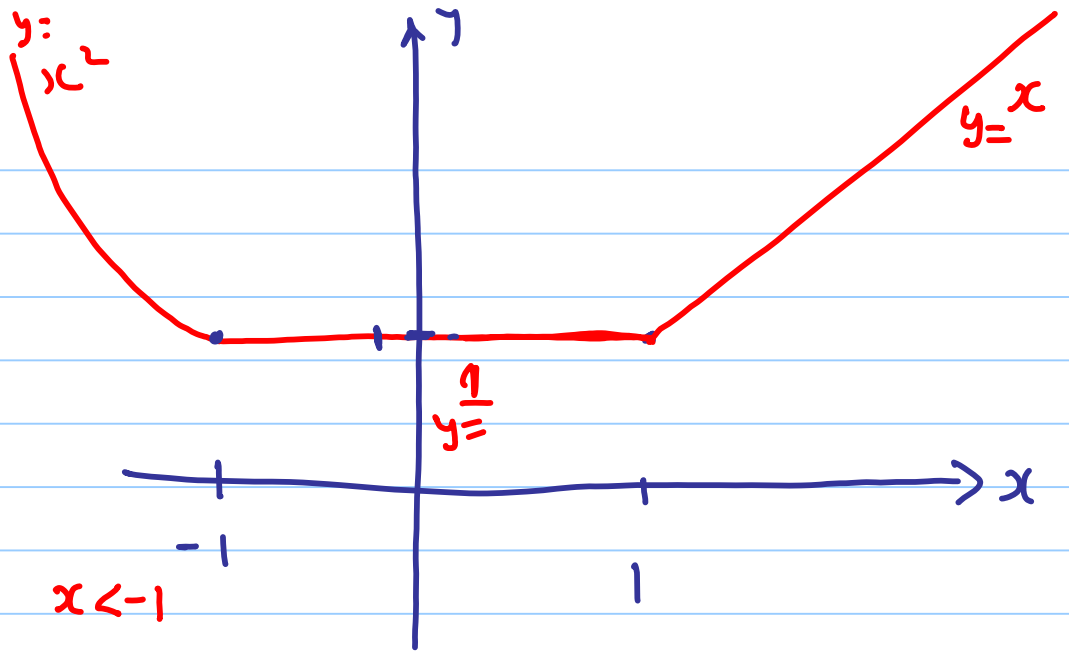
$$\text{a.r.o.c} = \frac{f(1)-f(0)}{1-0}$$

$$= \frac{1^4 - 0^4}{1-0} = 1$$

c) from $x = 1$ to $2$

$$\text{a.r.o.c} = \frac{f(2)-f(1)}{2-1}$$

$$= \frac{2^4-1}{1} = 16-1 = 15$$




graph of $g(x)$: