Average Rate of Change – Day 2

Example #1
Find the average rate of change over the following intervals, given the function $f(x) = 5x^2 - 3x + 2$

(a) $2 \leq x \leq 6$

(b) $x \in [1,2.5]$

Example #2
Kyle tracks the number of people at his party every hour:

t (time)	0	1	2	3	4	5
p(# people)	0	22	28	34	20	2

(a) find the average rate of change for each of the 1 hour time intervals

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(b) find the average rate of change for the interval $t \in [0,3]$

(c) find the average rate of change for the interval $t \in [3,5]$

NO GRAPH!

Average Rate of Change – Day 2

Example #1

Find the average rate of change over the following intervals, given the function

$f(x) = 5x^2 - 3x + 2$

$y = 5x^2 - 3x + 2$

(a) $2 \le x \le 6$

When $x=2$, $y=16$

$\therefore (2,16)$

When $x=6$, $y=164$

$\therefore (6,164)$

y	16	164
x	2	6

$$\text{Avg R.O.C.} = \frac{164-16}{6-2} = \frac{148}{4} = 37$$

(b) $x \in [1,2.5]$

When $x=1$, $y=4$

$\therefore (1,4)$

When $x=2.5$, $y=25.75$

$\therefore (2.5, 25.75)$

y	4	25.75
x	1	2.5

$$\text{Avg R.O.C} = \frac{25.75-4}{2.5-1} = \frac{21.75}{1.5} = 14.5$$

INTERVAL NOTATION

eg.1 $2 \le x \le 6$ $\quad x \in [2,6]$

eg.2 $6 < x < 10$ $\quad x \in (6,10)$

eg.3 $3 \le x < 8$ $\quad x \in [3,8)$

eg.4 $x \ge 2$ $\quad x \in [2,\infty)$

eg.5 $x < 5$ $\quad x \in (-\infty, 5)$

Example #2

Kyle tracks the number of people at his party every hour:

x	t (time)	0	1	2	3	4	5
y	p(# people)	0	22	28	34	20	2

(a) find the average rate of change for each of the 1 hour time intervals

1st hour

y	0	22
x	0	1

$$\text{R.O.C} = \frac{22-0}{1-0} = 22 \frac{\text{people}}{\text{hr}}$$

2nd hour: 6 ppl/hr

3rd hour: 6 ppl/hr

4th hour: -14 ppl/hr

5th Hour: -18 ppl/hr

(b) find the average rate of change for the interval $t \in [0,3]$

y	0	34
x	0	3

$$\text{Avg R.O.C.} = \frac{34}{3} = 11.3 \text{ ppl/hr}$$

(c) find the average rate of change for the interval $t \in [3,5]$

$$\text{Avg R.O.C.} = -16 \text{ ppl/hr}$$