

MAT 151 Calculus 1

Prof. Porter

Agenda

Lecture-

What is Calculus?

Ave Rate of Change

Introductions

Group work

Leccture

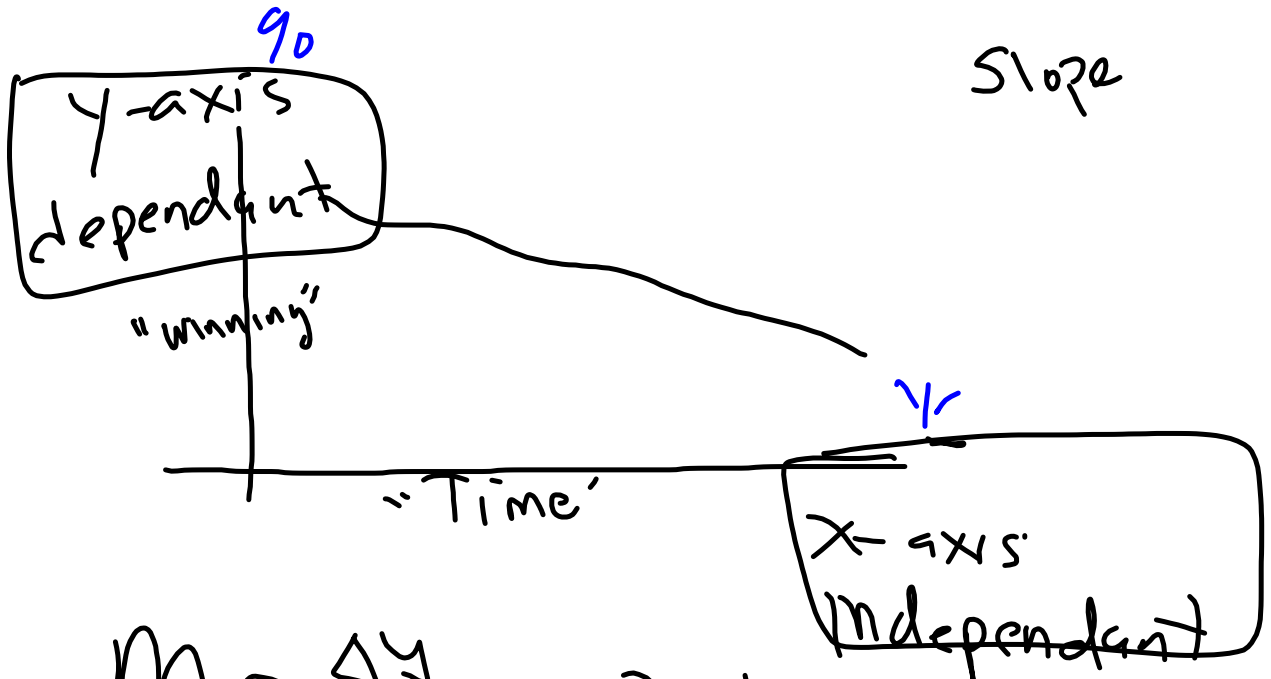
What is Calculus?

Ave Rae of Change

Math = Language

Precalc = Study of
Functions

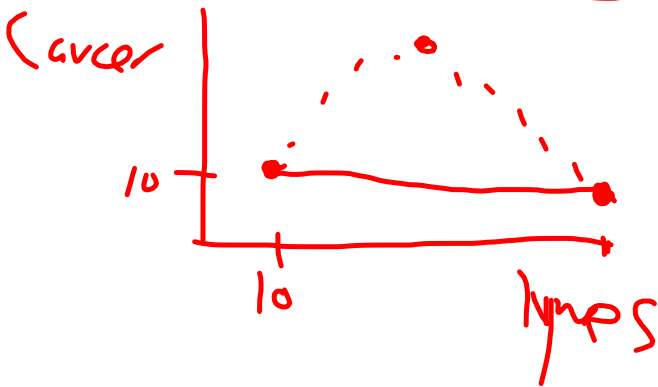
Calculus = Study of
Change.



Slope

$$m = \frac{\Delta y}{\Delta x} < 0 \text{ decreasing}$$

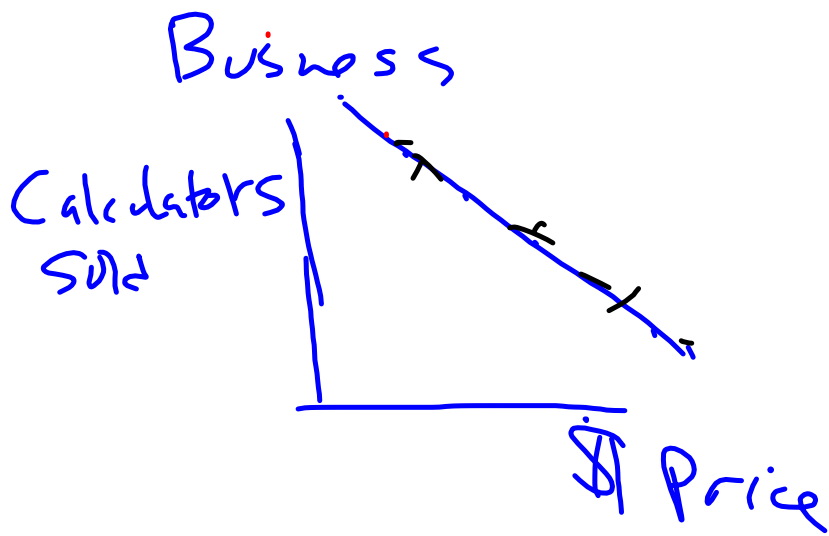
Change = -5% / yr per = division



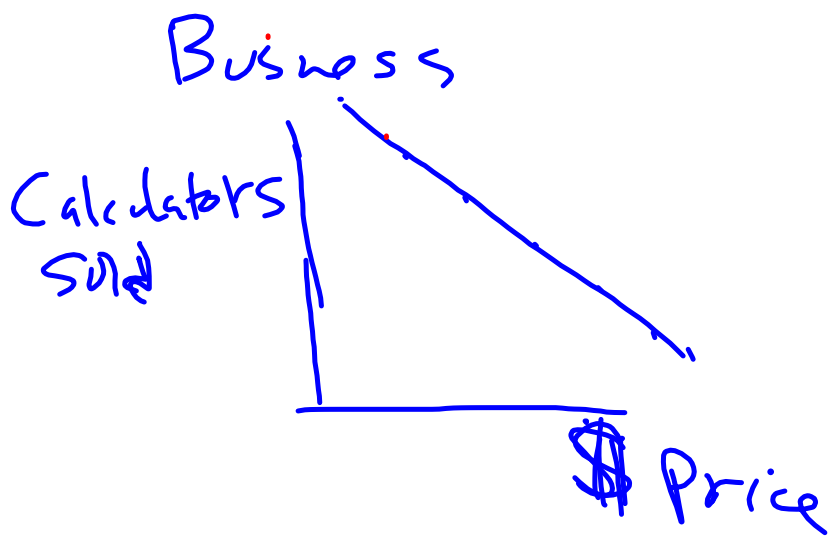
$$m = \frac{\Delta \text{Cancer}}{\Delta \text{Lymphs}} = 0$$

UNITS
 units of cancer

 units of lymphs

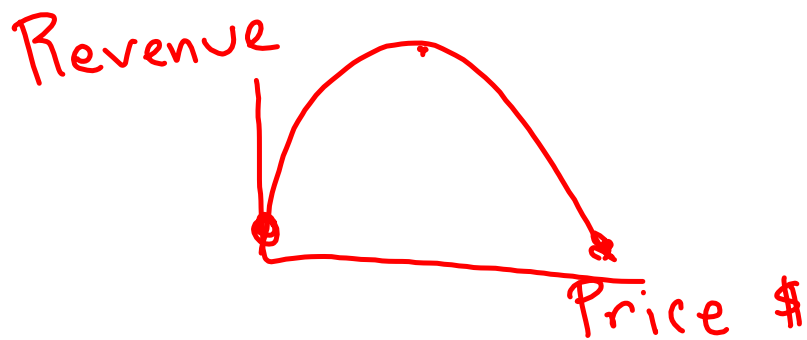


stat edit	
L1	L2
50	5
40	8
30	14



stat edit

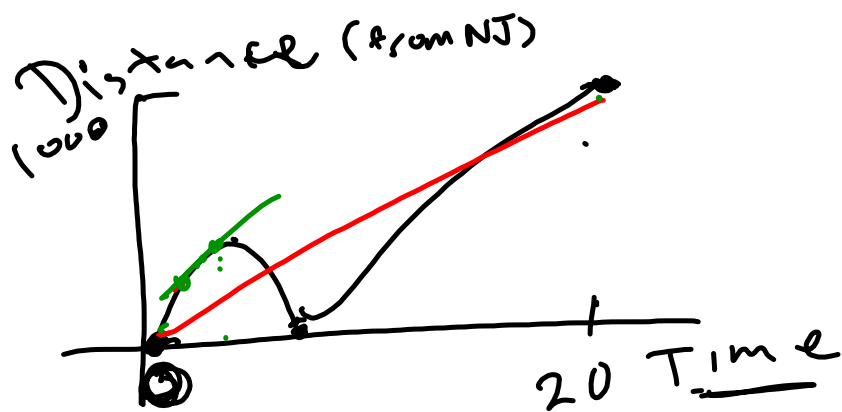
L1	L2
50	5 = 250
40	8 = 320
30	14 = 420
20	15 = 300



Average Rate of
Change

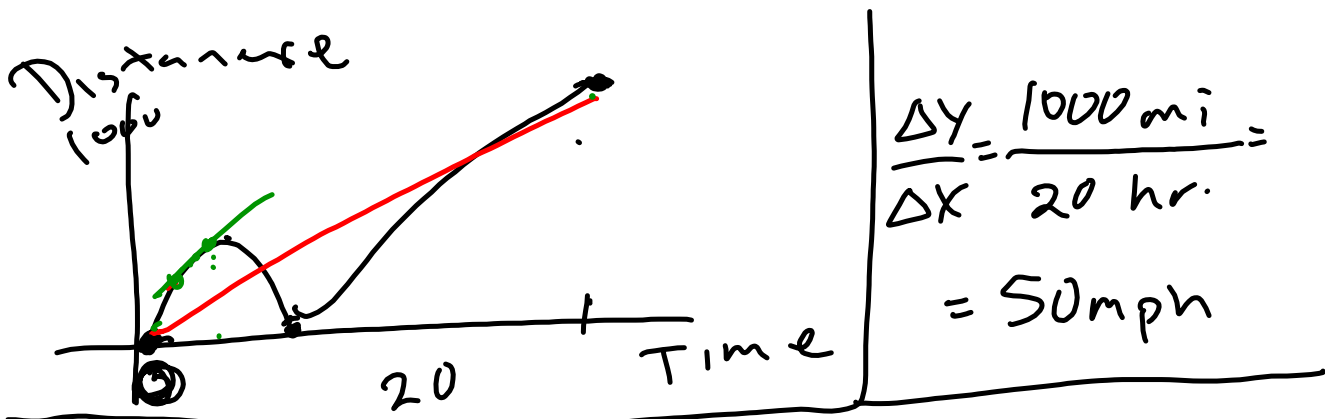


Slope of
Line
requires $\textcircled{2}$ points.



$$\bar{v} = \frac{\Delta y}{\Delta x} = \frac{1000 \text{ mi}}{20 \text{ hr}} = \text{Average speed}$$

↓
50 mph



$$\frac{\Delta Y}{\Delta X} = \frac{1000 \text{ mi}}{20 \text{ hr.}} = 50 \text{ mph}$$

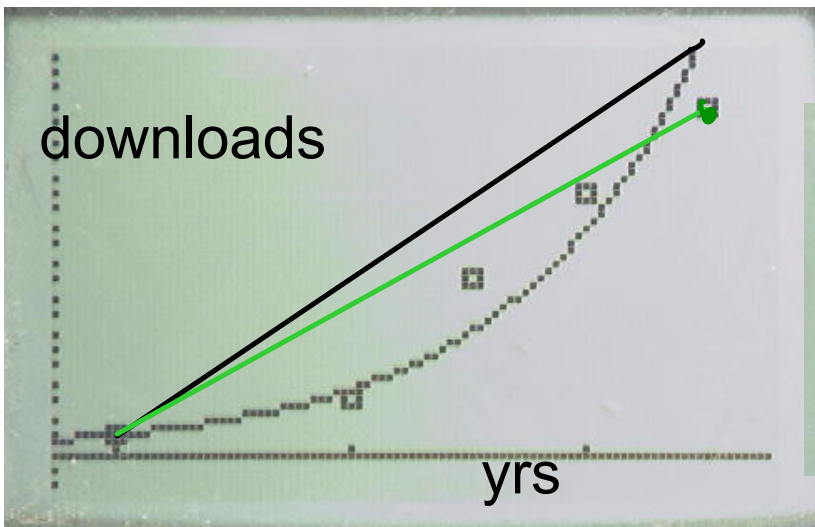
Average Rate
of Charge between 0 and 20 hrs
is 50 miles/hr

Using Sine regression
between 2016 and 2017
case of lymes are growing
at 6 percent per year

Two possibilities for ARC:

1. use beginning and ending data point
2. use beginning and ending points from regression (graph)

Comp Science



L1	L2
10	7
11	3
11.5	10
12	15
12.5	20
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ARC from regression
ARC from data

Introductions:

Prof Porter

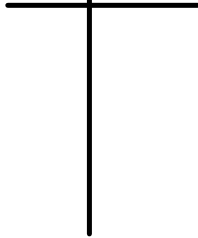
I....

"I love math"

Data Sets:

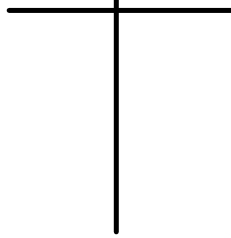
Science

Height	Weight
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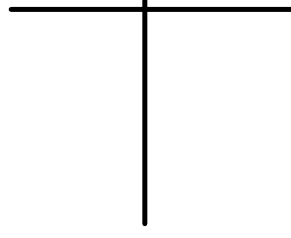
Business

Price	Revenue
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Anything

time	sex
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Groupwork

Groups (Three or more)

Same Major

Same Topic

5 data points

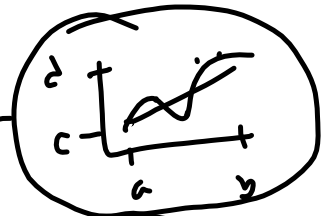
Producer (pictures/graphs)
Writer (math)
Speak (English)

Time v. Concp.	Price / Sales
Salary Sex	Work v. Success
Year <u>rate</u>	Height / weight
Decide Pop.	or something else?

Will post on Blackboard

Discussions

— Picture first.



↳ math

$$\frac{f(b) - f(a)}{b - a} = c$$

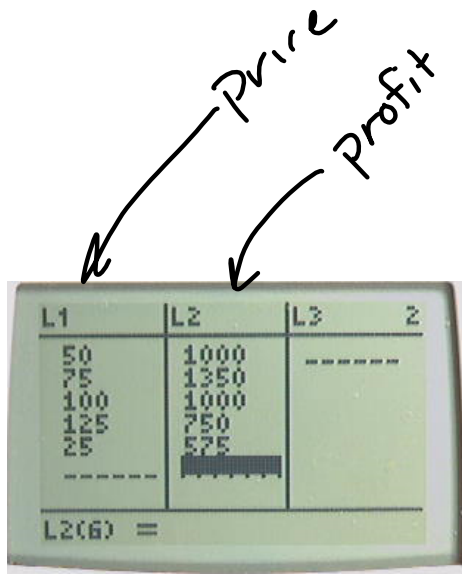
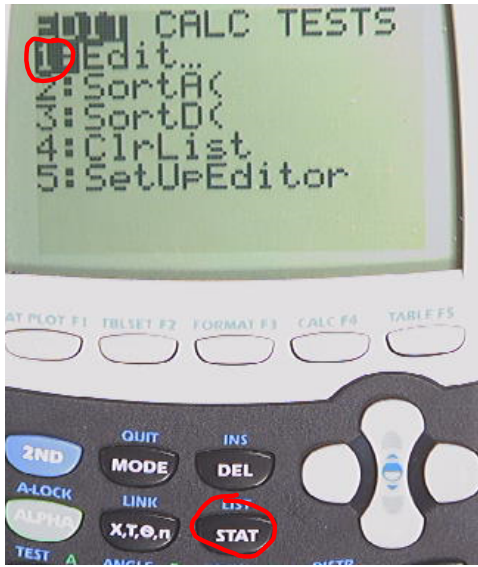
↳ words

"The ave. rate of change..."

(Present.
following class)

Calclator

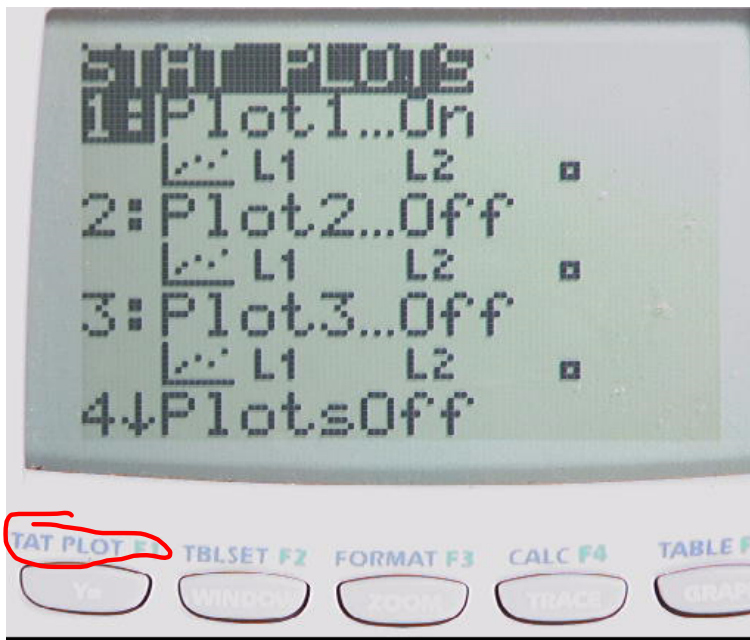
stat



L1	L2	L3	2
50	1000	-----	
75	1350		
100	1000		
125	750		
200	575		

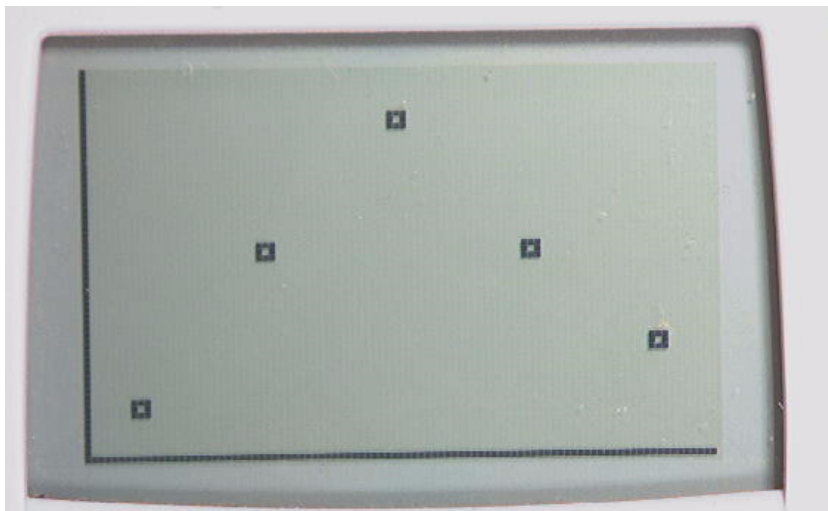
L2(6) =			

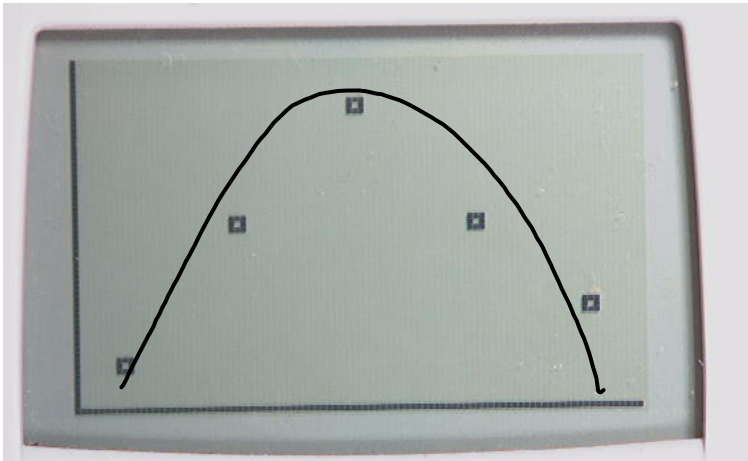
plot



2nd y=

zoom 9



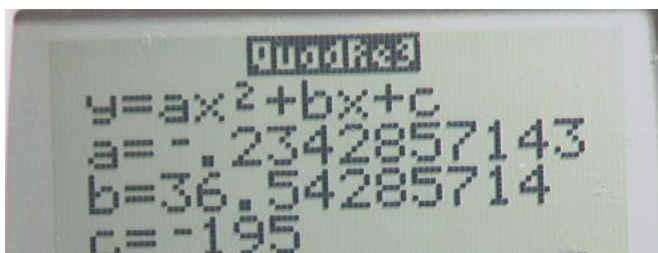
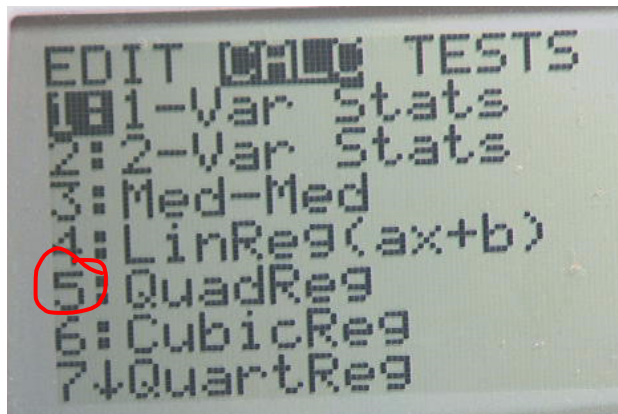


EQUATION???

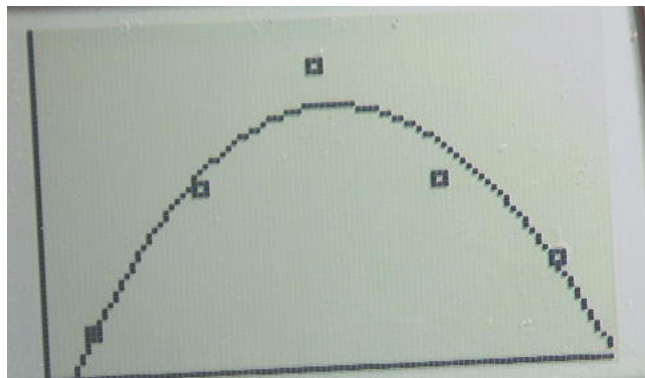
Decision: Parabola

Quadratic Regression

stat > calc



y = vars 5 >> 1
graph



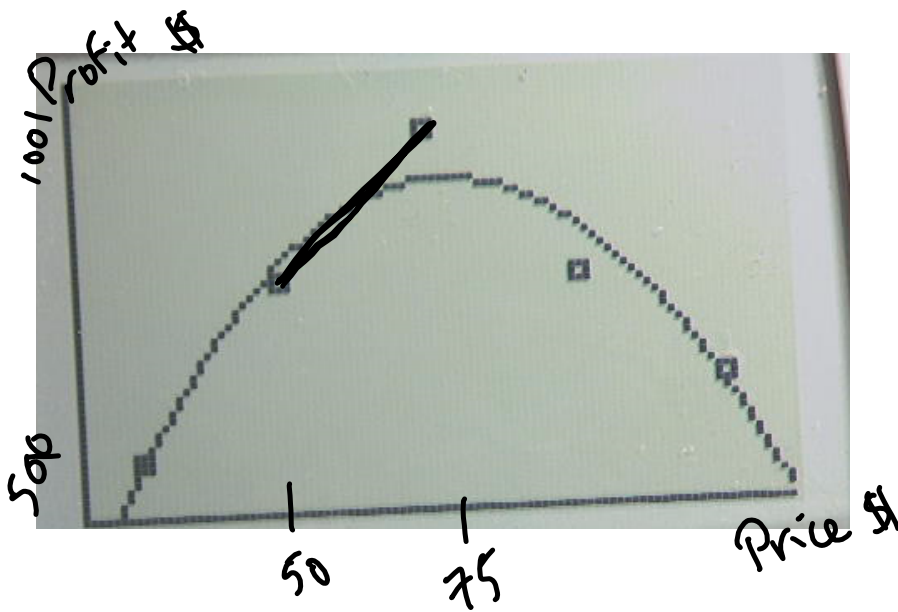
vars > 1 enter y1

y1(75)=1227....

$$\frac{Y_1(75) - Y_1(50)}{75 - 50} = \frac{\Delta Y}{\Delta X}$$

$$= \frac{Y_1(75) - Y_1(50)}{Ans \div 25} = 7.257142857$$

7.25 Profit per \$



$$\frac{y_1(75) - y_1(50)}{75 - 50} = 7.25$$

dollars per \$ charged

According to the quadratic regression of the data given, between \$50 and \$75 dollars charged, the average rate of change is 7.25 dollars per dollar charged.