To FInish 15, 16 , 17

y1=quartic regression

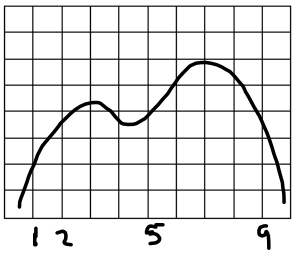
ax^4+bx^3+cx^2+dx+e

y2=nderiv(y1,x,x) or

4*ax^3+3*bx^2+2*cx^1+d

y3=nderiv(y2,x,x)

15. Graph the cubic or quartic regression, identify all critical points, concavity, and inflection points.



X:	1	2	3	4	5	6	7	8	9
Y'	3.5	2.5	.1	-.4	.6	1	-.1	-2	-5
Increasing or Deceasing	inc	inc	inc	dec	inc	inc	dec	dec	dec
Y''	-.5			+1	+2	-3	-5	-7	-9
Concavity? Up or Down	dw	dw	dw	up	up	dw	dw	dw	dw

table	y1	y2	y3
1	2.5	3.5	-.5
2	4.5	2.5	-.1
3	5.6	.1	-.01

16 Find critical Points

Critical Points are when y' = 0 or undefined

Look at table, try to guess at a number

4.5 sto x

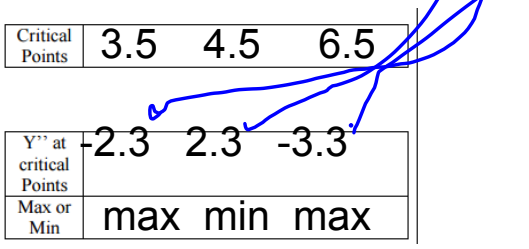
x - y2 / y3 sto x enter a bunch for Newtons Method x= 4.385...

4.5 sto x yields x =4.385

3.5 sto x yields x = 3.25

6.5 sto x yields 6.725

table	y1	y2	y3
1	2.5	3.5	-.5
2	4.5	2.5	-.1
3	5.6	.1	-.01
3.485	...	....	-2.3
4.5	...	...	2.3
6.5	...	...	-3.3



Critical Points	3.5	4.5	6.5
Y'' at critical Points	-2.3	2.3	-3.3
Max or Min	max	min	max

where are inflection points?

y" = 0

i think between 3.5 and 5.5

Inflection Points	3.725	5.875

3.5 sto x

x - y3 / nderiv(y3,x,x) sto x

enter ...enter...

Max and Mins

Maximize the Area of a rectangular pen with 100' of fence

Main idea A(L,W) = L W

Constraint: perimeter = 100 = 2L + 2W

solve for L = 50 - W

Main Idea A(W) = (50 - W) W = 50W - W^2

once in terms of one variable....take derivative

A' = 50 - 2W = 0 find critical vals

W = 25

L = 50 - W = 25

A"= -2 concave down MAX

three cans dog can, cat cans , soup for 1

88 sq in of metal for you cans

whats the biggest volume

main idea: Volume(H,R) = pi H R^2

constraint: pi R^2 (top) pi R^2 (bottom) + 2pi RH (sides) = 88

88 = 2pi R^2 + 2pi RH

H = (88 - 2piR^2)/(2piR)

Main Idea: V(R) = pi R^2 (88 - 2 pi R^2)/(2Pi R)

after calculus ... Critical point R = 2.16

H = 4.32

Soup for 1 is winner!