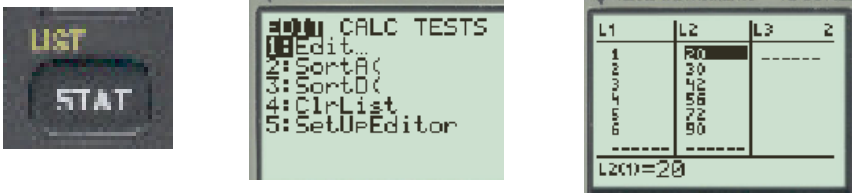# Determining General Term with the TI-83

Example:
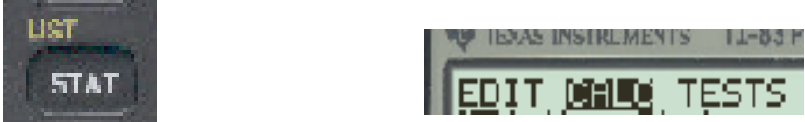
-4, -9, -18, -31, -48, -69, ...

Determine the general term, t_n, of the above sequence.

1. Determine if the sequence is linear, quadratic, cubic or quartic.
   (Using Levels of Difference-on your own paper)

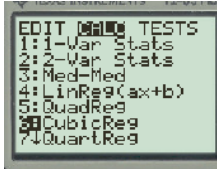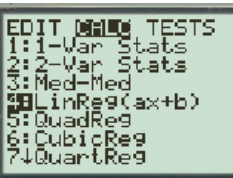2. Enter the data into Lists: $n \Rightarrow L_1$ $t_n \Rightarrow L_2$

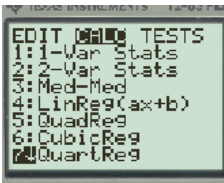3. Then "Calculate" the regression for the type of function determined by the level of diffences.
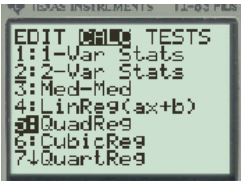

| Linear | $y = ax + b$ | Cubic | $y = ax^3 + bx^2 + cx + d$ |

| Quadratic | $y = ax^2 + bx + c$ | Quartic | $y = ax^4 + bx^3 + cx^2 + dx + e$ |

Can you come up with the general term for each of these??

1.

X	Y₁
1	1
2	-5
3	-11
4	-17
5	-23
6	-29
7	-35

X=1

$t_n =$

$D_1 \rightarrow 8, 22, 42, 68$
$D_2 \rightarrow 14, 20, 26$
$D_3 \rightarrow 6, 6$

2.

X	Y₁
1	3
2	11
3	33
4	75
5	143
6	243
7	381

X=1

$t_n = n^3 + n^2 - 2n + 3$

3.

X	Y₁
1	9
2	-4
3	-43
4	-120
5	-247
6	-436
7	-699

8	-1048
9	-1495
10	-2052
11	-2731
12	-3544
13	-4503
14	-5620

X=14

Cubic

D_3:

$= 0$

$6.8 E - 10$

$0 \cdots - - - - - - 6.8 \times 10^{-10}$

4.

X	Y₁
8	258
9	407
10	602
11	849
12	1154
13	1523
14	1962

X=8

$t_n = n^3 - 4n^2 + 2$

2

```
LinReg
 y=ax+b
 a=-3
 b=16
 r²=1
 r=-1
```
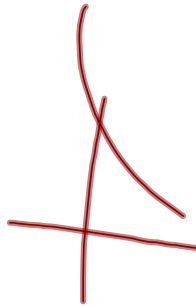
Correlation Coefficient

Positive Correlation

$$0 < r < 1$$

$$-1 < r < 0$$

Negative Correlation

HOMEWORK…

Worksheet - Levels of Differences.doc

Worksheet Solns - Levels of Differences.doc

Attachments

Worksheet - Levels of Differences.doc

Worksheet Solns - Levels of Differences.doc