	Fill in these columns after step 3					Fill in this column after step 4
DATA SET	**What is the equation of the best fit polynomial function?**	**What is the degree of the function?**	**How many roots (x-intercepts) does the graph have?**	**What is the first term of the equation?**	**Describe the lead <u>coefficient.</u> (Pos/Neg) and the <u>degree</u> (Even/Odd) EX: $2x^3$ is pos odd**	**Sketch the forecasted graph here to illustrate the end behavior of the polynomial.**
1						
2						
3						
4						
5						

DATA SET	What is the degree of the best fit polynomial function?	Number of x-intercepts (roots) the graph has?	What is the first term of the equation (state the variable, degree and lead coefficient)	Describe the lead <u>coefficient.</u> Pos/Neg Describe the <u>degree</u> Even/Odd (EX: $2x^2$ pos, even degree)	Forecast (at once) forward and back 10,000. Use the graph to Describe the "*end behavior*"of the function $x \to +\infty$ $y \to$? $x \to -\infty$ $y \to$?	Sketch the graph here (It should look like the parent function)
1						
2						
3						
4						
5						

GRAPHING POLYNOMIALS (Repeat these steps for data sets 1 – 5 on the back)

STEP 1

Input Data Set 1 into Excel

STEP 2

Use the chart wizard to generate a scatter plot.

Hi-lite the data in Columns A and B
Select the Chart Wizard and select the *XY Scatter* option (Scatter plot of just data points)
Follow the *next* button. You do not need to put in titles.
At the finish, save the chart as NEW SHEET.

STEP 3

Add a trend line.

While looking at the chart, right click any plotted point
Select *ADD TRENDLINE*.
In the dialogue box select the *polynomial* option.
The default *order* (degree) for the polynomial option is 2, which is quadratic. However not all polynomials are quadratic.
You must guess and test at the order of the polynomial that best fits your scatter plot.

Select the **options** tab and click "***Show equation on Chart***" and "***Show r^2 value on chart***"

NOW Click OK.

You will know that you have found the best regression curve when
All the points are on the curve
The equation has all integer coefficients
The r^2 correlation value is equal to 1

When the best regression curve and its equation have been found complete the table on the other sheet.

GRAPHING POLYNOMIALS (Repeat these steps for data sets 1 – 5 on the back)

STEP 1

Input Data Set 1 into Excel

STEP 2

Use the chart wizard to generate a scatter plot.

Hi-lite the data in Columns A and B
Select the Chart Wizard and select the *XY Scatter* option
Select the top option (Scatter plot of just data points)
Follow the *next* button. You do not need to put in titles.
At the finish, save the chart as NEW SHEET.

STEP 3

Add a trend line.

While looking at the chart, right click any plotted point
Select *ADD TRENDLINE*.
In the dialogue box select the *polynomial* option.
The default *order* (degree) for the polynomial option is 2, which is quadratic.
DO NOT PRESS OK
Select the options tab and click ***"Show equation on Chart"*** AND "***Show r^2 value on chart"***
The r^2 value indicates how well the equation correlates with the points on the graph.
NOW Click *OK*.
Guess and test at the order of the polynomial that best fits your scatter plot.

Look at the r^2 value.You will know that you have found the best regression curve when the r^2 value equals 1 and all the coefficients are integers. Many functions may correlate with an r^2 value of 1 but the rational zeroes means there must be integral coefficients.

When the best regression curve and its equation have been found complete the first five columns for the appropriate data set in the table on the other sheet.

STEP 4

Forecast the graph forward and backward 10,000.

Right click *the trend line*.
Select the *OPTIONS* tab.
Type *10,000* into the forecast forward and backwards fields
Click OK
Draw a rough sketch of the result in the appropriate column in the table on the other sheet.

DATA SET 1	
-6	0
-5	-7
-4	-12
-3	-15
-2	-16
-1	-15
0	-12
1	-7
2	0
3	9
4	20
5	33
6	48
7	65
8	84

DATA SET 2	
-7	-264
-6	-100
-5	0
-4	48
-3	56
-2	36
-1	0
0	-40
1	-72
2	-84
3	-64
4	0
5	120
6	308

DATA SET 3	
-7	480
-6	0
-5	-180
-4	-180
-3	-96
-2	0
-1	60
0	60
1	0
2	-96
3	-180
4	-180
5	0
6	480

DATA SET 4	
-7	150
-6	0
-5	-72
-4	-84
-3	-54
-2	0
-1	60
0	108
1	126
2	96
3	0
4	-180
5	-462
6	-864

DATA SET 5	
-9	-21
-8	-12
-7	-5
-6	0
-5	3
-4	4
-3	3
-2	0
-1	-5
0	-12
1	-21
2	-32
3	-45
4	-60
5	-77