

Activity 5: Quadratic Modeling II

A scientist measures the performance rating of a subject on a task after measuring various anxiety levels in the subject. Her data is listed in the chart below.

Anxiety level	2	4	6	8	10	12	14
Performance	31.5	36	38.5	39	37.5	34	28.5

You can apply the Polynomial Difference Theorem to determine that the data points fit a quadratic function: $y=ax^2+bx+c$.

1. Each group member should pick three points from the data set to determine the values for a, b, and c by solving a system of equations.
2. Complete the square to find the vertex of the parabola.
3. Graph the data on grid paper.
4. Make a scatter plot on your calculator and show that the equation fits the data.
5. Answer the following graphically (using TRACE or CALC) and algebraically (showing all steps).
When does the performance peak?
When is performance zero?
What is the performance at anxiety level zero?

Quadratic Regression

6. Verify your results using quadratic regression
7. Use three points to determine a model for the data. Adjust your model. Compare your results with the regression model.

Anxiety level	1	2	4	5	7	10	13
Performance	55	66	75	82	80	63	33