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|  | **Level** | | | | |
| **R** | **1** | **2** | **3** | **4** |
| **Description**  **2%** | Missing | Useless  Contained numerous English errors. | Adequate but missed some key points  Several English errors. | Thorough and  mostly well written. | Thorough and very well written |
| **Instructions for using the software  3%** | Missing | Useless | Present but vague or inaccurate. | Thorough and  fairly easy to follow. | Thorough and very easy to follow |
| **List of functions and arguments**  **15%** | Missing | Functions were poorly chosen, poorly named and poorly described  The list bore little resemblance to the Python code. | Some functions were logically chosen and named, but there were several inaccuracies  The list covered some of the functions in the Python code, but there were several mismatches | Most functions were logically chosen, logically named and well described  The list covered most of the functions in the Python code, with 1-2 mismatches | All functions were logically chosen, logically named and well described  The list covered all of the functions in the Python code |
| **Test cases**  **15%** | Missing | 1-6 cases provided  Test cases covered only a few types of inputs | 7-9 cases provided  Test cases covered some possible inputs, but missed several key types | 10 or more cases provided  Test cases covered a range of inputs, but missed an important type | Well over 10 cases provided  Test cases covered the full range of possible inputs |
| **Team work**  **15%** | The team was completely ineffective | The team did not work productively and needed many reminders to stay on task  One or two members carried the whole team, while others were allowed to hang back and do very little. | The team worked productively sometimes but needed reminders to stay on task  Members tried to divide the work but had difficulty ensuring that everyone did their fair share | The team worked productively for most of the project.  All members did their fair share of the work on most days | The team worked productively throughout the project.  All members did their fair share of the work everyday |

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|  | **Level** | | | | |
| **R** | **1** | **2** | **3** | **4** |
| **Extracting coefficients**  **10%** | Missing | Program only takes a, b, c as input | Program has a function that takes a quadratic function as an argument and returns the coefficients, but with major errors | Program has a function that takes a quadratic function as an argument and returns the coefficients, but with a minor error | Program has a function that takes a quadratic function as an argument and returns the correct coefficients |
| **Drawing the parabola**  **25%** | Missing | Program contains a function for drawing the graph but it is inaccurate or doesn’t work at all. | Program draws isolated points that lie on the parabola  Parabolas match the data for some test cases but contain errors or are improperly scaled | Program draws a smooth parabola with axes  Parabolas match the data for most test cases | Program draws a smooth parabola with labeled axes and tick marks  Parabolas match the data for all test cases |
| **Finding the roots and vertex**  **5%** | Missing | Program contains functions for calculating the vertex, but they’re inaccurate or don’t work at all. | Program calculates and prints the vertex & roots, but with major errors. | Program calculates and prints the vertex & roots, but with a minor error. | Program calculates and prints the correct vertex & roots for all test cases |
| **Assembling the whole analysis**  **10%** | Missing | Program contains a single procedure that takes the trinomial as input, but it doesn’t work well with the other functions. | There is a single procedure takes the quadratic function as input, but some of the functions have to be run individually to do the full analysis | A single procedure takes the quadratic function as input and uses the other functions to do most of the analysis. | A single procedure takes the quadratic function as input and coordinates the other functions in the program to carry out the analysis. |