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Part 1-PSS 1

**Analysis Report**

After opening the CSV file generated by my program in Excel and creating a scatter plot, the resulting graph is a parabola, as expected. This shape aligns with the quadratic formula used to generate the data. Below are the specific details for the values and formulas applied.

**First Parabola**

A graph with a line

Description automatically generated

The first parabola was generated using an X-range of -100.0 to 100.0 with a step interval of 1.0. The coefficients for the quadratic equation were a = 1.0, b = -2.0, and  c = 3.0 . In this context, -100.0 and 100.0 define the lower and upper bounds of the X-range, respectively, while 1.0 sets the step interval for incrementing X. The coefficients a, b, and c correspond to the terms ,  x , and the constant in the equation.

**Second Parabola**

A graph with a curve

Description automatically generated

The second parabola was also generated with an X-range of -100.0 to 100.0 and a step interval of 1.0. However, the coefficients were a = -3.0, b = 2.0 , and  c = 3.0 . This configuration was chosen to represent a basic parabola derived from a quadratic equation with a negative coefficient for ,  resulting in a downward-facing curvature.

**Third Parabola**

A graph with a line

Description automatically generated

The third parabola utilized the same X-range and interval as the previous examples but had coefficients of a = 3.0 ,  b = 2.0 , and  c = 6.0 . These values were selected to demonstrate a parabola with a positive coefficient for  ,  producing an upward-facing curvature and showcasing a distinct quadratic shape.

**Code Implementation**

A screen shot of a computer program

Description automatically generated

The program used to generate the CSV file applies the quadratic formula and offers flexibility for users to specify the range of X-values, the increment interval, and the coefficients for  ,  x , and the constant term c. It incorporates an error-handling approach that ensures overall reliability, focusing on managing potential failures in the file-writing process, which is the most error-prone aspect. The output is a well-structured CSV file containing the computed values, which can be visualized and analyzed using tools such as Excel.

**Conclusion**

The program successfully generated parabolic data sets using the quadratic formula. The graphs confirm the expected shapes based on the specified coefficients. The program’s flexibility in parameterization, coupled with its robust error-handling design, makes it reliable and user-friendly for generating and visualizing quadratic data.