# Graphing Scatterplots to Write Equations and Make Predictions

## Tutorial Overview

In this tutorial, you will learn how to create a scatterplot and regression equation with the TI-Nspire™ CX. Follow the steps below to solve problems that include writing an equation for a given set of data and making a prediction as shown in the example below from the 2023 STAAR Algebra 1 Released Test (item 13).

An experiment examined the relationship between the number of miles a car traveled, $y$, per gallon of gasoline and the speed of the car, $x$, in miles per hour. The table displays the data collected.

**Car Mileage Experiment**

| Speed, $x$ (miles per hour) | Miles per Gallon, $y$ |
|---|---|
| 20 | 24.9 |
| 30 | 28.3 |
| 35 | 29.1 |
| 40 | 30.1 |
| 50 | 30.0 |
| 60 | 29.1 |

A quadratic function can be used to model the data in the table. Which value best estimates the miles per gallon when the speed is 65 miles per hour?
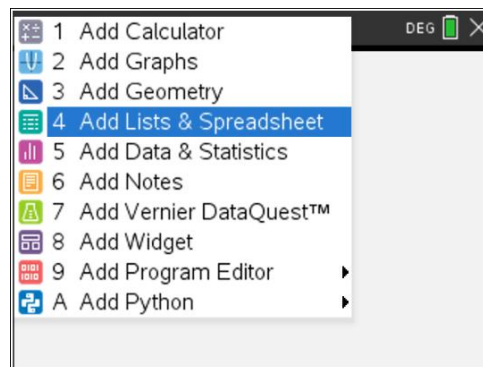
Ⓐ 27.9

Ⓑ 31.0

Ⓒ 40.2

Ⓓ 24.9

**Graphing Scatterplots to Write Equations and Make Predictions**

**Step 1**: Create a Lists & Spreadsheet application page.

Press ⌂on, select **1 New Document**, and **4 Add Lists & Spreadsheet**.

| | |
|---|---|
| 1 | Add Calculator |
| 2 | Add Graphs |
| 3 | Add Geometry |
| 4 | Add Lists & Spreadsheet |
| 5 | Add Data & Statistics |
| 6 | Add Notes |
| 7 | Add Vernier DataQuest™ |
| 8 | Add Widget |
| 9 | Add Program Editor |
| A | Add Python |

TEXAS INSTRUMENTS

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**Step 2**: Enter the given data.

Label column A by pressing ▲ on the Touchpad and typing $x$. Move to the cell at the top of column B, type $y$, and press enter.
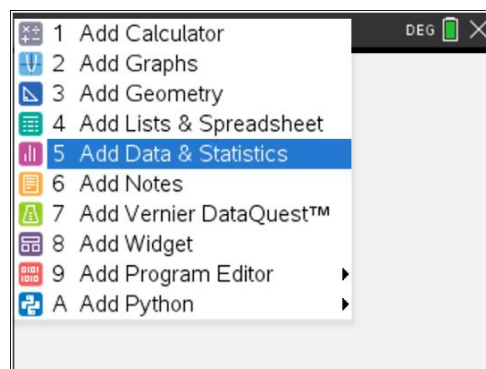
Move the cursor to cell A1 and enter the data in column A. Next, move the cursor to cell B1 and enter the data in column B.

*Note*: Pressing enter or ▼ will move the cursor to the next cell.

| | A x | B y | C | D |
|---|---|---|---|---|
| = | | | | |
| 1 | 20 | 24.9 | | |
| 2 | 30 | 28.3 | | |
| 3 | 35 | 29.1 | | |
| 4 | 40 | 30.1 | | |
| 5 | 50 | 30. | | |

B13

**Step 3**: Add a Data & Statistics application page.

Press ctrl doc▾ and select **5 Add Data & Statistics**.

1 Add Calculator
2 Add Graphs
3 Add Geometry
4 Add Lists & Spreadsheet
5 Add Data & Statistics
6 Add Notes
7 Add Vernier DataQuest™
8 Add Widget
9 Add Program Editor
A Add Python
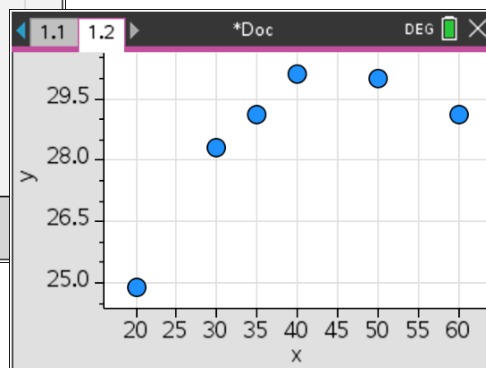
**Step 4**: Create scatterplot.

Move the cursor to the horizontal axis label where it says, "Click to add variable". The message "Click or Enter to change variable" will appear. Press 🖱 or enter to display the variables. Select the $x$ variable.
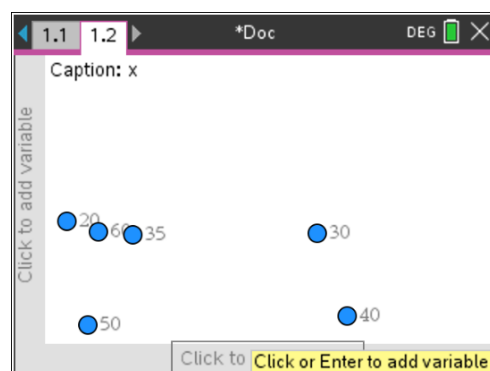
Move the cursor to vertical axis label where it says, "Click to add variable". The message "Click or Enter to change variable" will appear again. Press 🖱 or enter to display the variables. Select the $y$ variable.
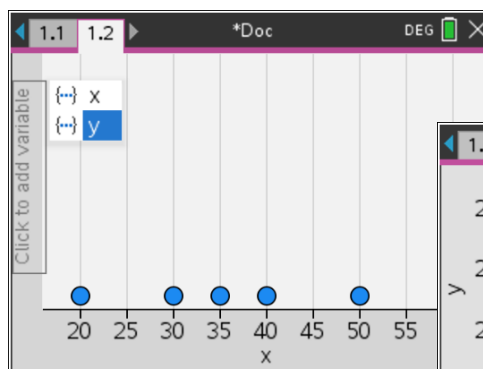
The scatterplot will be shown in a window that fits all the data values.

**TEXAS INSTRUMENTS**

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**Graphing Scatterplots to Write Equations and Make Predictions**
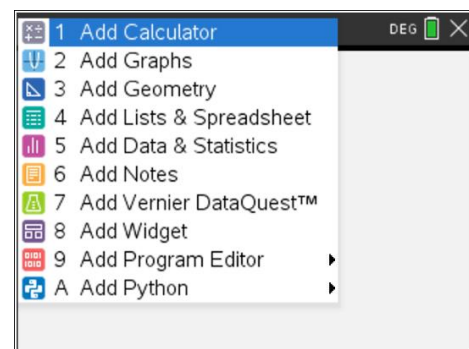
**Step 5**: Create Regression Equation.

We will create a quadratic regression equation since the scatterplot has a parabolic pattern.

Press menu, **4 Analyze**, **6 Regression**, and **4 Show Quadratic**. The regression equation is displayed on the scatterplot with the coefficient of determination, $r^2$.
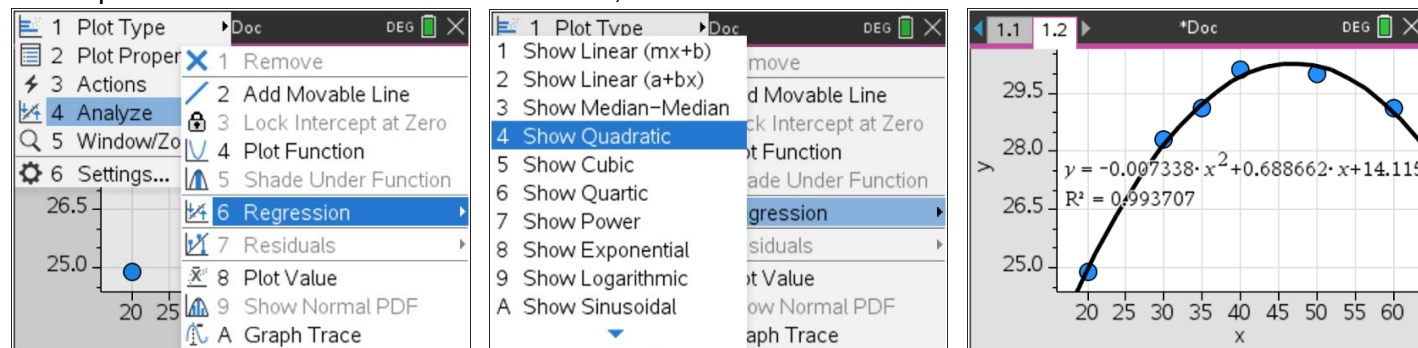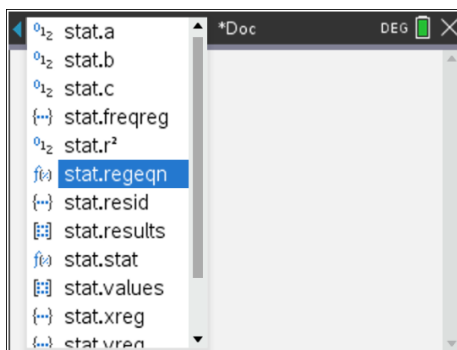


**Step 6**: Make Prediction.

Press ctrl doc▾ and select **1 Add Calculator.**



Press var and select **stat.regeqn**.



Enter 65 inside the parenthesis and press enter to evaluate the regression equation at a speed of 65 miles per hour.



A car traveling at a speed of 65 miles per hour will have approximately 27.9 miles per gallon. The answer is A.

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A quadratic function can be used to model the data in the table. Which value best estimates the miles per gallon when the speed is 65 miles per hour?

Ⓐ 27.9

Ⓑ 31.0

Ⓒ 40.2

Ⓓ 24.9

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