

Lesson Four: Determining Regression Equations

Goal: To develop and use mathematical models to solve problems.

There are many types of relationships between two quantities. In this course, we will focus on linear and quadratic relationships. Once we identify the type of relationship, we can use the graphing calculator to interpret the data and determine an equation that best models the data. This type of equation is called a regression equation.

Finding equations that match real life situations is called "mathematical modelling". Mathematical models are used in physics, biology, earth science, meteorology, computer science, artificial intelligence, economics, psychology, sociology, political science, and many other fields. Mathematical models help to describe and explain situations and are used to make predictions.

Example 1: Linear Regressions

When a scatterplot of data shows a linear pattern, we can develop a linear equation to model the situation, as shown in the following examples.

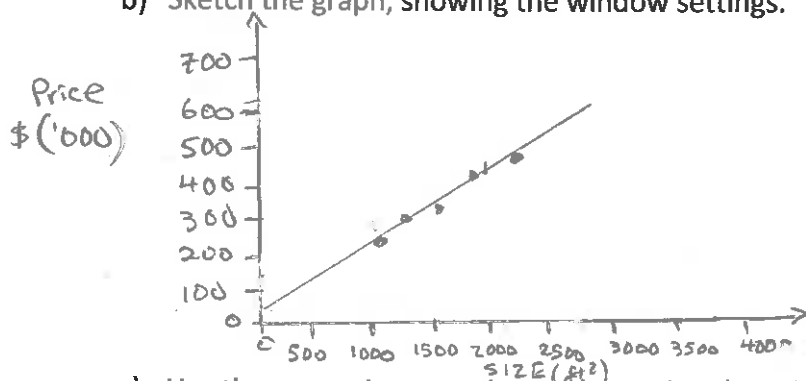
The table shows some data collected regarding the relationship between the size of a house in a certain neighbourhood and the price of the house.

L1 x	L2 y
Size (ft ²)	Price (\$)
1150	268 000
1380	265 500
1568	349 000
1950	440 000
2490	499 950

- a) Determine the linear regression equation that models this situation. The instructions on how this is done are found on the next page.

$$y = 191.84x + 36092$$

- b) Sketch the graph, showing the window settings.



- c) Use the regression equation to determine the price of a house that is 2000 ft².

2nd TRACE ENTER x = 2000 ENTER $y = 420584 \Rightarrow \$420584$

- d) Determine the price of a house that is 3400 ft².

2nd TRACE ENTER x = 3400 ENTER $y = 689162$

$\$689162$