

14.1 Linear Equations with One Independent Variable

Using one variable (x = predictor = independent) to predict another variable (y = response = dependent).

We will only be looking at "lines" or linear equations to make our predictions.

14.24 (pg. 623)

charge \$55 per hour, plus \$30 service charge.

a. $30 + 55x = y$

x = hours y = total charge

$$\hat{y} = a + bx$$

b) Find a_0 & a_1

$b_0 = b = 30$ y intercept

$a_1 = b = 55$ slope

calculator: $\hat{y} = a + bx$

book: $\hat{y} = b_0 + b_1x$

c) Find y for the x values: 0.5, 1, 2.25

x	y
0.5	57.5
1	85
2.25	153.75

$y = 30 + 55(.5)$

Graph (1.) L_1 and L_2

(2.) 2nd stat plot

(3.)

graph of the data points is a

scatterplot

if somewhat linear, then we can find the regression equation.

if not linear, don't find a regression equation.

To Find regression equation:

$$\hat{y} = a + bx \quad \text{use STAT}$$

TESTS

LinRegTTest

Find a & b , plug them into $\hat{y} = a + bx$

$$\boxed{\hat{y} = 30 + 55x}$$

put into $y =$

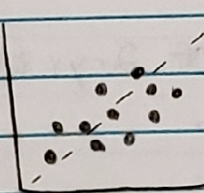
$$a = 30$$

$$b = 55$$

Next Section: Regression Equation 14.2

Recall, if scatterplot is linear, we will find the regression equation $\hat{y} = a + bx$. If NOT, don't find regression equation.

example:



pattern is linear ✓

Terms

An outlier is a point on the scatterplot far away from the rest of the points.

An influential observation is a point on the scatterplot that greatly changes the regression equation (we would typically remove these before we find regression equation).

$x = \text{age of car}$

14.59 (pg. 636) car prices: $y = \text{value of car (\$100s)}$

CALC:

L1

L2

put in x (ages of car)

put in y (value)

(a) & (b.) find and graph regression equation and scatterplot

$$\hat{y} = a + bx \rightarrow \boxed{\hat{y} = 456.6 - 27.9x}$$