

Essential Question: How can we use our graphing calculator to determine the linear regression equation for a set of bivariate data?

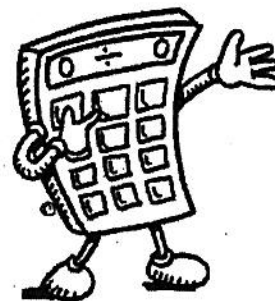
Do Now: Refer to last night's HW.

Write the equation of your trend line here: $y = 12x - 4$

Using the Graphing Calculator to find the Linear Regression Equation

*One-time process (or after the calculator has been reset)

- 2nd 0 (CATALOG)
- Scroll down to DIAGNOSTICS ON
- ENTER, ENTER
- Mode
- Arrow Up ↑
- Stat Diagnostics ON



I. Enter the bivariate data into List 1 (L₁) and List 2 (L₂)

1. STAT #1 (EDIT)
2. List distance into L₁ and time into L₂

II. Creating the Scatter Plot

3. 2nd y = (STAT PLOT) #1 ENTER
4. Turn On and Choose Scatter Plot
5. ZOOM #9 (ZOOM STAT)

III. Determining the Linear Regression Equation

6. STAT arrow over to CALC #4 (LinReg (ax + b))

Fill in the following information from your calculator.
LinReg(ax + b)

a = 11.42241379 slope

b = -3.77586 y-intercept

r = .97319192 correlation coefficient

How do we graph the trend line on the calculator?

- 1) Press y =
- 2) Enter equation in y₁
- 3) Press Graph

Linear Regression Equation: $y = 11.422x - 3.776$

Discussion Question: How is this information from our calculator useful?

The equation can help us predict information (interpolate and extrapolate).

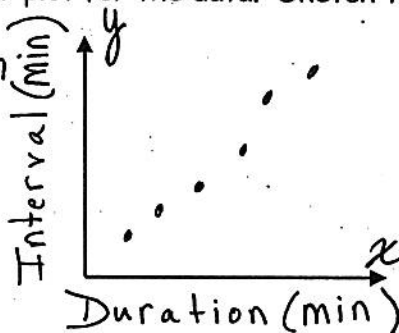
Examine the data in the table below and complete a - d.

The table below shows the duration of several eruptions of the geyser Old Faithful and the interval between eruptions.

x	Duration (minutes)	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
y	Interval (minutes)	50	57	65	71	76	82	89	95

(a) Use your graphing calculator to create a scatter plot for the data. Sketch the graph below. Describe the correlation.

Strong Positive Correlation
The longer the eruption, the longer the wait time is until the next eruption.



(b) Use your graphing calculator to calculate the equation for the line of best fit.

a: 12.64285

b: 32.03571

$$y = 12.643x + 32.036$$

(c) What is the correlation coefficient? What does it say about the data?

$r = .998651482$

Very Strong Positive Correlation

(d) If the geyser erupted for 7 minutes, predict the amount of time that would pass before the next eruption occurred.

(x, y)
duration interval

$$y = 12.643(7) + 32.036$$

$$y = 120.537...$$

$\approx 120 \frac{1}{2}$ minutes (2 hours and

The TAKEAWAY

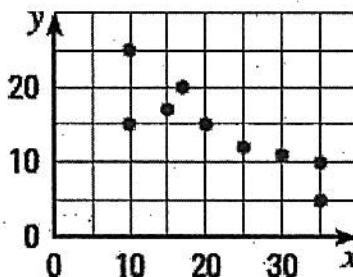
Which equation best models the data in the scatter plot?

(A) $y = 15$

(B) $y = -\frac{1}{2}x + 26$

(C) $y = -\frac{2}{5}x + 19$

(D) $y = -\frac{4}{5}x + 33$



30 seconds)

Our calculator can help us summarize a set of data by determining the equation of the trend line (linear regression model). We can use this equation to make predictions (*interpolate and extrapolate*).