

## Algebra RH

**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: \_\_\_\_\_

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## Using the Graphing Calculator to find the Linear Regression Equation

**\*One-time process:**

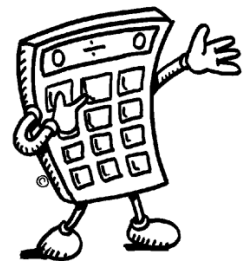
- MODE
- Arrow Down
- STAT DIAGNOSTICS ON

**I. Enter the bivariate data into List 1 ( $L_1$ ) and List 2 ( $L_2$ )**

1. STAT #1 (EDIT)
2. List distance into  $L_1$  and time into  $L_2$

**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 = slope

b = y-intercept

r = correlation coefficient

*How do we graph the trend line on the calculator?*

- 1) Press y =
- 2) Enter equation in  $y_1$
- 3) Press Graph

**Linear Regression Equation:** \_\_\_\_\_ (round all values to the nearest thousandth).

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

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.

Duration (minutes)	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
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.



- (b) Use your graphing calculator to calculate the equation for the line of best fit (round all values to the nearest hundredth).

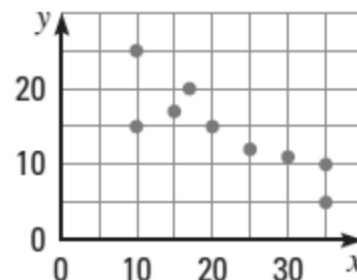
- (c) What is the correlation coefficient? What does it say about the data?

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

### 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  $y = -\frac{4}{5}x + 33$



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

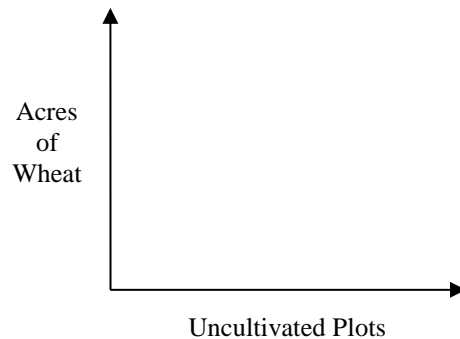
Use your graphing calculator to sketch a scatter plot of the data represented in the table below.

<b>Uncultivated Plots</b>	1	2	4	5	8
<b>Acres of Wheat</b>	225	195	155	146	75

A. What is the correlation coefficient? Describe the correlation.

Correlation Coefficient: \_\_\_\_\_

Description:



B. Using your graphing calculator, determine the linear regression equation.

Equation: \_\_\_\_\_

C. Using your equation, predict the number of acres that would exist if there were 4.5 uncultivated plots.