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:_____

_____

Using the Graphing Calculator to find the Linear Regression Equation

*One-time process (or after the calculator has been reset)
- MODE
- Arrow Down
- STAT DIAGNOSTICS ON

> **TO RESET CALCULATOR:**
> With the calculator off, hold down the left and right arrows and turn on the calculator.

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)

or

> 3. y =
> 4. Arrow up to PLOT1 → ENTER
> 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.
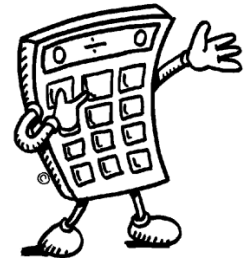 LinReg(ax + b)

  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 3 decimal places)

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

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, 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.
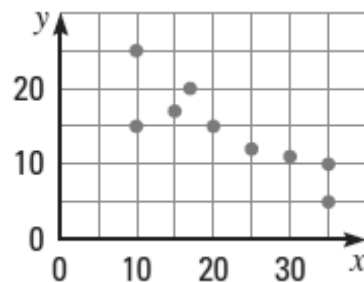
(c) To the nearest thousandth, what is the correlation coefficient? What does it say about the data?

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

The
TAKE AWAY

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.

Uncultivated Plots	1	2	4	5	8
Acres of Wheat	225	195	155	146	75

A. To the nearest thousandth, what is the correlation coefficient? Describe the correlation.

Correlation Coefficient: _____

Description:

Acres
of
Wheat

Uncultivated Plots
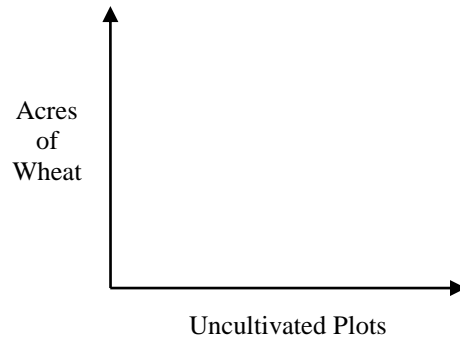
B. Using your graphing calculator, determine the linear regression equation. Round all values to the nearest hundredth.

Equation: _____

C. Using your equation, predict the number of whole acres that would exist if there were 7 uncultivated plots.

Is this an example of interpolation or extrapolation? _____