**Goal:** Find the line of regression using technology and determine correlation.

Example 1: Enter the Weight into L1 and Price into L2 in the handy dandy graphing calculator.

a. Enter data into calculator: STAT→Edit…

Weight x	Price y (U.S. $)
0.18	702.00
0.17	517.50
0.25	963.00
0.29	1290.00
0.27	1080.00
0.15	484.50
0.20	747.00
0.25	1017.00
0.21	724.50
0.17	529.50
0.35	1629.00
0.33	1417.50
0.26	994.50
0.16	513.00
0.12	334.50
0.18	664.50
0.15	430.50
0.16	507.00
0.16	498.00
0.23	829.50

Source: Journal of Statistics Education

Questions
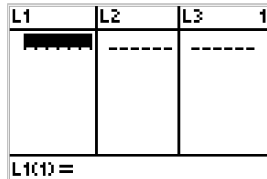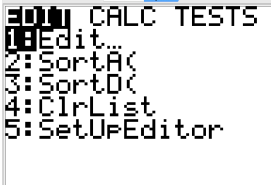
b. View scatterplot: Press STAT PLOT (above Y=). Turn Plot1 On, choose scatter plot, and choose L1 as Xlist and L2 as Ylist. Then select GRAPH. If scatterplot does not show up, then select ZOOM→ 9.
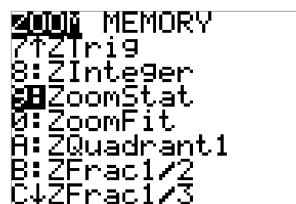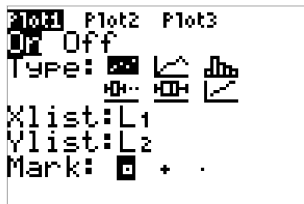
c. Graph the *trend line*: Select STAT → CALC → 4: LinReg(ax+b). Choose L1, L2 and Y1 in menu (TI-83: LinReg(ax+b) L1, L2, Y1)
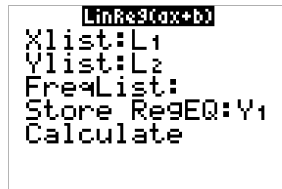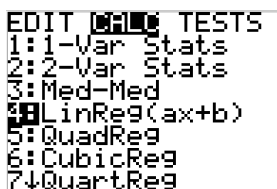
$r \approx$ _____ regression line: _____

d. According to the linear regression, how much should a 0.5 carat diamond ring cost?

The video to the right will walk you through another example using the TI-84.

Questions	

	The Line of Best Fit: is also called _____ or the _____. It has the following characteristics:
	
	  a. It is *the* line that minimizes the sum of _____ _____
	
	  b. It contains the _____ of the data, that is, the point $(\bar{x}, \bar{y})$ which are the mean of the *x*-values and the mean of the *y*-values.
	  c. Its slope and intercept can be computed directly from the given data (although nearly too tedious to do so by hand).
	
	Based on the line of regression from the example, verify that the center of mass (0.212, \$793.65) is on the line.
	
	Next, find the sum of squared residuals for the linear regression.
	
	Correlation
	The line of best fit will have a special number associated with it. This number is called the **correlation coefficient**, *r*. The closer *r* is to -1 or 1, the stronger correlation the data has.
	
	Get the correlation coefficient (*r*) from your calculator or computer
	
	  ▪ *r* has a value between -1 and +1:
	
	What is the correlation coefficient for the regression line? _____
	
	Describe the correlation? _____

	Questions
Practice: Consider the table at the right that relates curb weight of certain 2008 vehicles and their estimated highway mpg.	

Curb Weight (000 lb)	Highway mpg
2.6	34
6.8	18
5.7	23
4.1	22
3.5	28
2.5	37
3.4	30
6.0	16

a. Find the line of best fit for the data .

b. Find the correlation coefficient .

c. Describe the correlation.

d. What does the slope mean in this context?

Correlation vs Causation

The correlation coefficient, *r*, provides a mathematical measure of _____, but does *not* provide information about _____.

Check out http://tylervigen.com/discover for some interesting correlations.

Summary: