Correlation: relationship between two quantities

Positive Correlation

As x increases,
y increases

Pos Slope

Negative Correlation

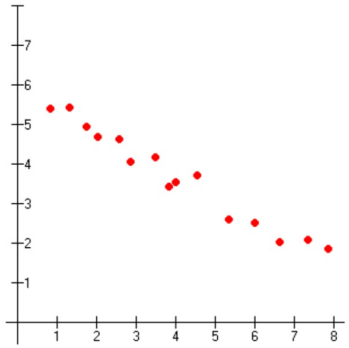
As x increases,
y decreases

Neg Slope

No Correlation

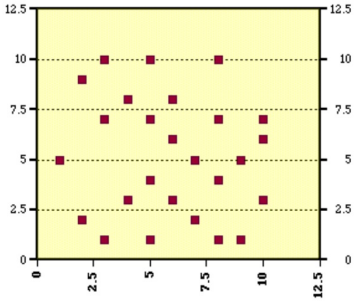
No relationship between quantities

What type of correlation does each graph show?



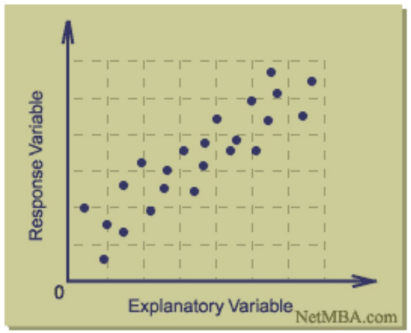
Negative Correlation, pretty Strong

What type of correlation does this graph show?



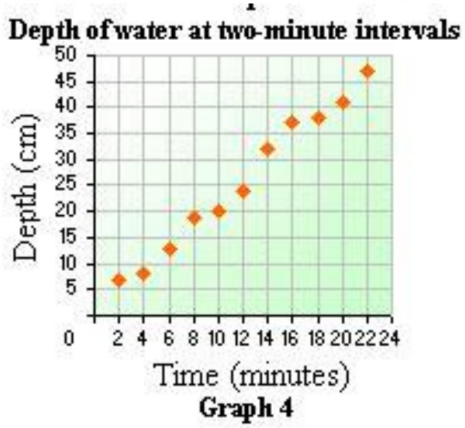
No Correlation

What type of correlation does this graph show?



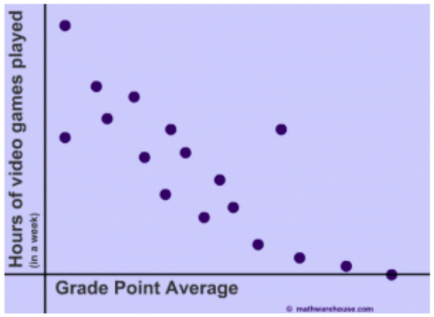
Positive Correlation
rather Weak

What type of correlation does this graph show?



Positive Correlation
quite Strong

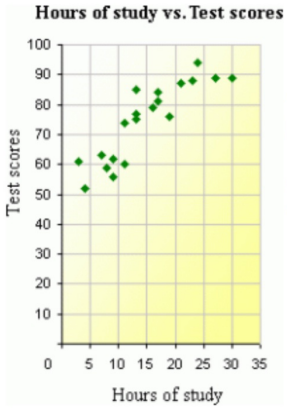
What type of correlation does this graph show?



Negative Correlation

rather Weak

Is this a Strong or Weak Positive Correlation?

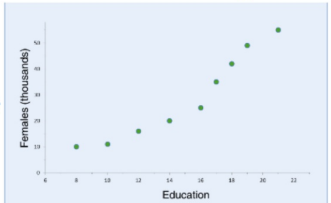


"Strong" and "Weak" are sometimes hard to define.

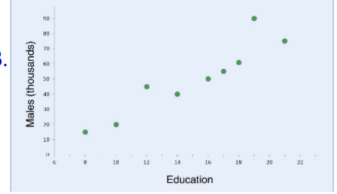
Sometimes you only use these terms when comparing two scatter plots

Which correlation is stronger?

A.

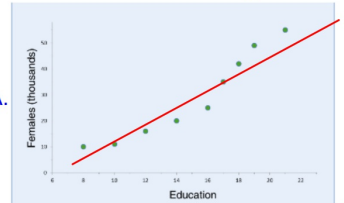


B.

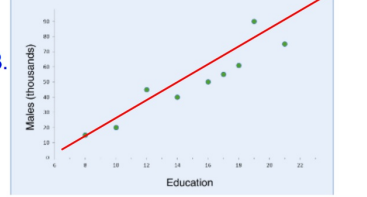


Which correlation is stronger?

A.



B.



These are both pretty strong positive correlations but given the trend lines drawn it appears Graph A is a little stronger. More points are closer to the line.

Strong Correlation vs Weak Correlation

The closer the data points are to forming a line the stonger the Correlation

Scatter plots on the graphing calculator.

x (year)	2005	2006	2007	2008	2009
y (sales)	12	19	29	37	45

Enter the data:

STAT 1:Edit

Enter x(year) in L_1

Enter y(sales) in L_2

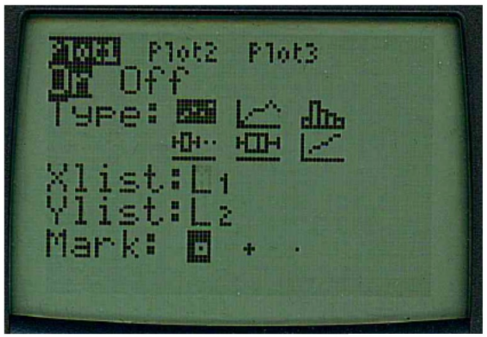
To make a scatter plot on the graphing calculator:

1. Press 2nd then Y=

2. Turn on a Scatter Plot

3. Make sure your screen looks like this

4. Press Zoom then choose Option 9:



x (year)	2005	2006	2007	2008	2009
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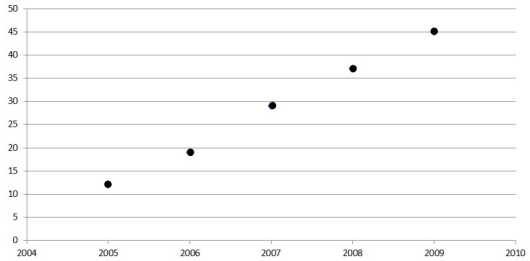

What if you don't have a graphing calculator to make a scatter plot?

- Use a sheet of graph paper
- Use spreadsheet software such as Excel
- Use the internet

Finding the equation of the

"Line of best fit"

using technology.

Linear Regression:
finding the equation of the "line of best fit".

x (year)	2005	2006	2007	2008	2009
y (sales)	12	19	29	37	45

Doing a Linear Regression on the graphing calculator.

STAT → CALC 4: LinReg (ax+b)

Regression Equation: 8.4x - 16830.4

Graphing the Regression Equation with the scatter plot:

1. Press Y=
2. Type in the Regression Equation
3. Press GRAPH

Does this equation appear to be a good fit for the data?

x (year)	2005	2006	2007	2008	2009
y (sales)	12	19	29	37	45

Regression Equation: y = 8.4x - 16830.4

1. Use this line to predict the sales in 2012.

   replace x with 2012

   y = 8.4(2012) - 16830.4 = 70.4

2. In what year will the sales reach 100?

   replace y with 100 100 = 8.4x - 16830.4

   solve for y: y = 2015.52