

AP Stat--Quiz Yourself on Scatterplots

KEY

1. A scatterplot shows the relationship between two quantitative variables measured on the same individuals. Each point represents one individual's values for each variable.

An explanatory variable is the variable that influences change.

3. A response variable is the variable that measures an outcome

4. The variable plotted on the horizontal axis is the explanatory variable, and the variable plotted on the vertical axis is the response variable. Technically, there may not be a "explanatory-response" relationship, but they are plotted as such.

5. You can describe the pattern of a scatterplot by the direction, form, and strength of the relationship.

6. In analyzing a scatterplot, look for the overall pattern and for striking deviations from the pattern. An important deviation, as we learned before is an outlier.

7. If the direction of the pattern in the scatterplot is from lower left to upper right, the association is positive. If it goes from upper left to lower right, it is negative.

8. To add a categorical variable to a scatterplot, use a different Color for each variable.

9. The direction and strength of the linear relationship between the two quantitative variables is called correlation. It is represented by r.

10. If you had to calculate r by hand, you would use the formula:  $r = \frac{1}{n-1} \sum \left( \frac{x_i - \bar{x}}{s_x} \right) \left( \frac{y_i - \bar{y}}{s_y} \right)$

11. Define all the variables in the formula from #10.  $n$  = sample size  $x_i$  and  $y_i$  = indiv. x and y data values

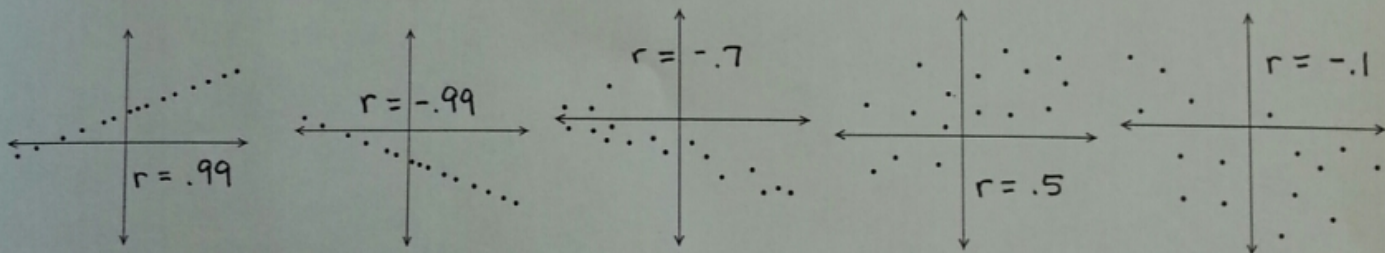
$\bar{x}$  and  $\bar{y}$  = avg. of x values, avg of y values  $s_x$  and  $s_y$  = st. dev. of x values + y values

12. The correlation coefficient r is within the range  $-1 \leq r \leq 1$ . If the association is positive and strong then r will be close to 1. If the association is negative and strong then r will be close to -1. If there is no correlation, r would be 0.

13. Like mean and standard deviation, correlation is not resistant to outliers.

14. Changing the units of measure of the variables does not change the correlation.

15. For each scatterplot, approximate r.



Calculator Quiz:

I. Where do you enter the values for your explanatory and response variables? In your lists

II. If you enter data and press GRAPH but you can't see the scatterplot, what could be the problem? you may need to resize your window  $\Rightarrow$  Zoom, #9

III. Where do you find LinReg (a+bx)? stat, calc, #8

IV. How can you calculate r for a linear regression? LinReg L1, L2