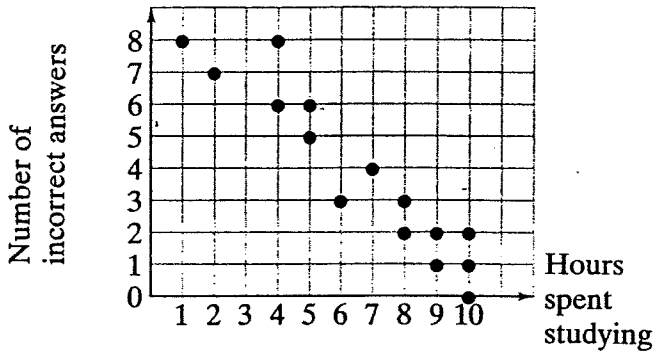
Algebra I
Notes 1.7 Lines of Best Fit and Correlation Coefficients

C ctives: Identify and draw a line of best fit for a scatter plot.
Understand and determine closeness of fit using correlation coefficients.

A **line of best fit** approximates the correlation of the data on a scatter plot. The line does not necessarily have to pass through any of the points but should take all of the points into consideration.

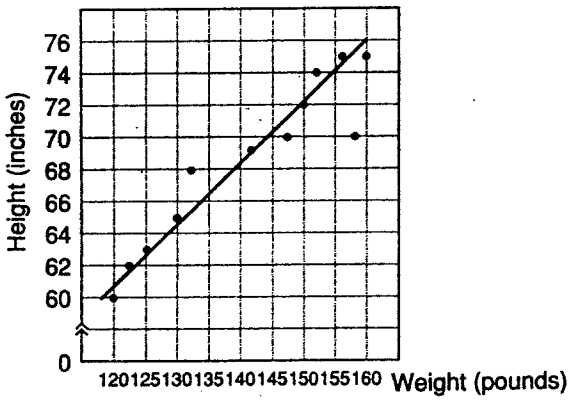
A **line of best fit** goes through the **middle** of the data points and shows the trend.

Draw a line of best fit through this scatter plot.



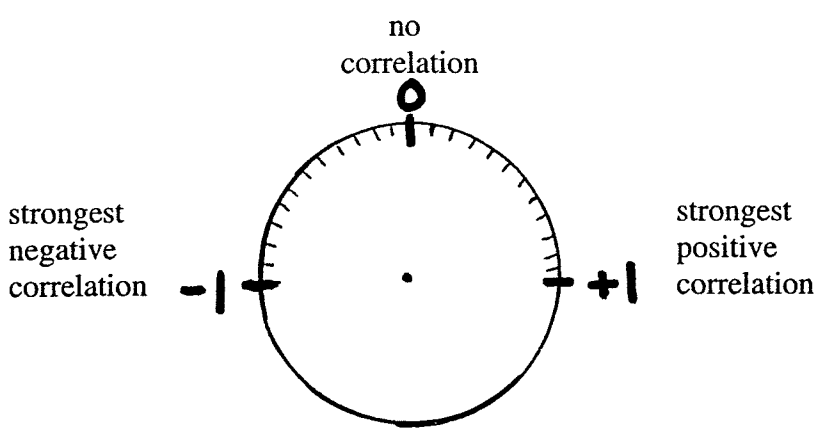

correlation coefficient ≈ _____

T line of best fit shown below shows a **strong positive correlation** between height and weight.



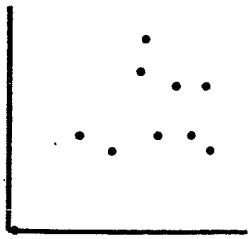

correlation coefficient ≈ _____

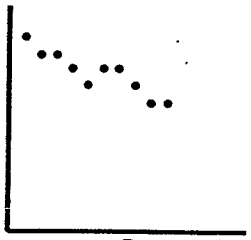
***How strong is the correlation? How close is the data to the line of best fit?*** These questions are answered with correlation coefficients. Refer to the scale of correlation coefficients below:

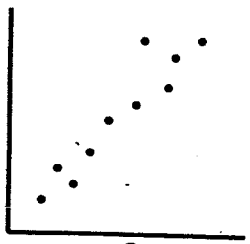


Graphing calculators will calculate a correlation coefficient for you. You can approximate the "closeness" of a line of best fit by using a value between –1 (strongest negative) and +1 (strongest positive).

**Match the scatter plot with the statement that best describes it.**


A


B


C

1. To prepare for a race, Jack, a healthy young athlete runs one mile every day for 10 weeks. The variables graphed are week numbers and average time to run one mile per week. _____

2. Susan participated in a physical fitness program for six months. Her strength in a selected exercise was tested at regular intervals and graphed. _____

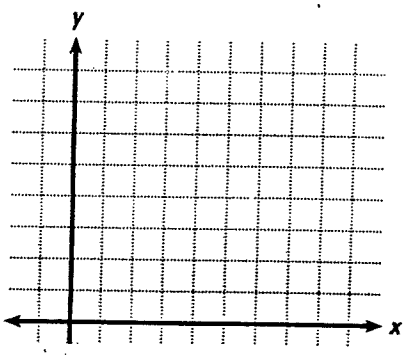
3. For which scatter plot(s) above does it seem reasonable to fit a straight line to the data? _____

4. Draw a line of best fit for the scatter plots you identified in question #3.

5. Which scatter plot above would most likely have a correlation of −0.85? _____

6. Which scatter plot would most likely have a correlation of 0.95? _____

7. Use the grid to plot points (0,1), (1,2), (2,4), and (3,8) Then use a straightedge to estimate the line of best fit.




8. Is the correlation nearest to −1, 0, or 1?

_____

9. **Dogs age differently than humans do. You may have heard someone say that a dog ages 1 year for every 7 human years. However, that is not the case. The table at the right shows the relationship between dog years and human years.**

Estimate the correlation coefficient. _____