

14.5 Linear Correlation

M. Goodroe - Quantitative Skills and Reasoning

Key Terms:

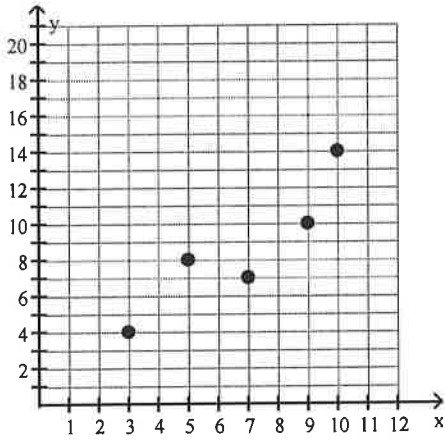
- Scatterplot
- Linear Correlation Coefficient ("r" Value)
- Significat Linear Coefficient
- Line of Best Fit

Name: _____

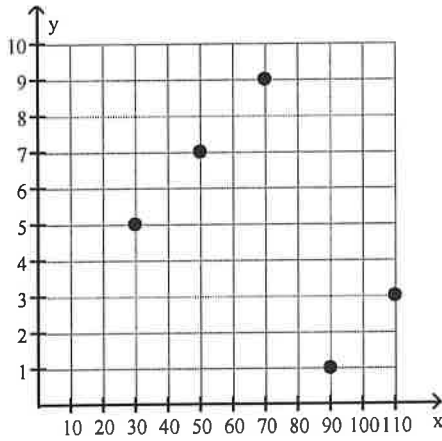
SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

State what kind of correlation, if any, the scatterplot indicates.

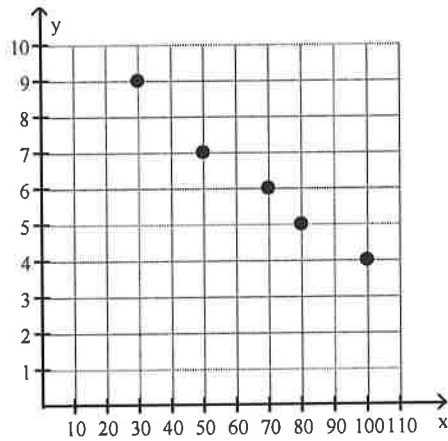
1)



2)



3)



Plot the data pairs to visually estimate the linear correlation coefficient (r-value) Additionally, use a calculator or Microsoft Excel to calculator the linear correlation coefficient.

4) (2, 11), (2, 6), (10, 6), (18, 2)

5) (3, 4), (5, 8), (6, 7), (6, 8)

Use the table below to determine whether we can be 95% or 99% confident that there is significant linear correlation between y.

n	$\alpha = 0.05$	$\alpha = 0.01$
4	0.950	0.999
5	0.878	0.959
6	0.811	0.917
7	0.754	0.875
8	0.707	0.834
9	0.666	0.798
10	0.632	0.765
11	0.602	0.735
12	0.576	0.708
13	0.553	0.684
14	0.532	0.661
15	0.514	0.641
16	0.497	0.623
17	0.482	0.606
18	0.468	0.590
19	0.456	0.575
20	0.444	0.561

6) (5, 6), (7, 8), (9, 10), (11, 11), (12, 13)

Find the line of best fit for the data.

7) (24, 15), (26, 13), (28, 20), (30, 16), (32, 24)

8) As a car begins to accelerate, the gas mileage is poor. As the speed increases, the gas mileage continues to increase. Gas mileage increases for a while, then as the speed increases further, the mileage begins to decrease. The table of below illustrates this.

Speed in Miles per Hour	Mileage in Miles per Gallon
30	25
40	30
50	31
60	30
70	28

Determine the linear correlation coefficient for the data and also determine whether we can be 95% or 99% confident that there is significant linear correlation between the variables.

9) The table below lists the number of years of education past high school and the annual income of five people.

Years of Education Past High School	Annual Income (in \$thousands)
0	21
2	23
3	24
4	26
5	26