

Example 1: Plot the data from the following table of randomly selected test grades. The *x* column is for the test number and the *y* column is the grade made on that test.

Comment on any trend or pattern you see in the data. If a trend is observed, draw a line of "best-fit."

x, Test #	y, grade
1	75
5	65
8	45
12	85
16	80
19	60

Example 2: Plot the data from the following table of randomly selected test grades. The *x* column is for the test number and the *y* column is the grade made on that test.

Comment on any trend or pattern you see in the data. If a trend is observed, draw a "line of best-fit."

x, Test #	y, grade
1	45
5	50
8	70
11	70
14	85
18	90



No pattern is observed. The grades are not steadily going up or down. Rather they seem to be randomly scattered.



The grades seem to be steadily increasing with each new test.

Example 3: Plot the data from the following table of randomly selected test grades. The *x* column is for the test number and the *y* column is the grade made on that test.

Comment on any trend or pattern you see in the data. If a trend is observed, draw a "line of best-fit."

x, Test #	y, grade
2	95
5	90
7	70
10	75
13	55
15	60
17	45
19	30



The grades seem to be steadily decreasing with each new test.

Positive correlation:

When the "line of best-fit" has a **positive slope** as was seen in Example 2, it can be said that the data plot has **positive correlation** (also called a **positive trend**).

Negative correlation:

When the "line of best-fit" has a **negative slope** as was seen in Example 3, it can be said that the data plot has **negative correlation** (also called a **negative trend**).

No correlation:

When there is no line of best-fit and the data seems to be **randomly scattered** as was seen on Example 1, it can be said that the data plot has **no correlation**.

Example 4: Identify the data plots in the three previous examples as having either positive, negative, or no correlation.



Example 2 _____*positive correlation* _____

Example 3 <u>negative correlation</u>

Example 5: From this scatter plot and line of best-fit, find the equation of the line of best-fit. (Use the rise and run indicated in the picture to find the slope.)

What is the correlation of this scatter plot?





negative correlation

Example 6: From the line of best-fit developed in Example 5, what would be the expected grade on test 22?

$$y = F(x) = -\frac{25}{8}x + \frac{765}{8}$$

$$F(2x) = -\frac{25}{8}(x^2) + \frac{765}{8} = \frac{2/5}{8} = 26.875$$

Assignment: In problems 1-6 determine if there is positive, negative, or no correlation of the data. Draw a line of best-fit (if possible).



7. From this scatter plot and line of best-fit, find the equation of the line of best-fit. (Use the rise and run indicated in the picture to find the slope.)

What is the correlation of this scatter plot?

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8. From this scatter plot and line of best-fit, find the equation of the line of best-fit. (Use the rise and run indicated in the picture to find the slope.)

What is the correlation of this scatter plot?



9. From this scatter plot and line of best-fit, find the equation of the line of best-fit. (Find two points through which the line passes and use the rise and run from those two points to find the slope.)

What is the correlation of this scatter plot?

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10. Draw a line of best-fit for this scatter plot and then find the equation of the line.

What is the correlation of this scatter plot?

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11. From the equation of the linear 12. From the equation of the linear function in problem 9, find the value of function in problem 10, find the value of f(-20). f(12). 13. Plot the data from the following table of randomly selected test grades. The x column is for the test number and the y 75 column is the grade made on that test. Comment on any trend or pattern you see 50 in the data. If a trend is observed, draw a line of "best-fit" and then find the equation of the line. 25 x, Test # y, grade 1 85

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10 13

14

18

85

70 70

65

55

55