

Mean: 24

0	3	3	4	6	→ 3, 3, 4, 6
1	5	7	7	9	→ 15, 17, 17, 19, 19

24 - 3 = 21
24 - 15 = 9

Find the Mean Deviation: 17.22

Apr 23-11:26 AM

CORRELATION

Occurs when there is a relationship between two events

3 types:

Positive correlation: when both events vary in the same direction (both increasing).

Negative correlation: when the events vary in opposite directions (usually "x" increases while "y" decreases)

Zero correlation: when no relationship exists.

Apr 23-1:29 PM

LINEAR CORRELATION

Correlations is linear when the points in the scatter plot tend to approach a line.

The more the points tend to approach a line, the stronger the linear correlation.

The correlation is positive if the points tend toward a line with a positive slope and negative if the line has a negative slope.

Apr 23-1:36 PM

In each of the following situations, indicate whether the linear correlation is weak, average, strong or very strong. Indicate the sign of the correlation.

a) Weak, -
b) Weak, +
c) A, +
d) S, -
e) 0
f) A, +
g) S, +
h) A, -

Apr 23-1:43 PM

LINEAR CORRELATION COEFFICIENT

Measures the strength of the relationship between two variables. It is a number between -1 and 1

$-1 \leq r \leq 1$

- When the correlation coefficient is equal to 1 or -1, it is a perfect correlation. The points in the scatter plot are on a line with a positive slope (if $r = 1$) or a negative slope (if $r = -1$).
- As the correlation coefficient approaches 1 or -1, the points tend to get closer to a line with a positive slope (if $r > 0$) or a negative slope (if $r < 0$).
- As the correlation coefficient approaches 0, the more the points become scattered and less aligned.
- In the case of a total lack of linear correlation, the correlation coefficient is equal to zero.

Therefore, we have:

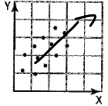
Perfect negative correlation: -1
Strong negative correlation: -0.7
Average negative correlation: -0.5
Weak negative correlation: -0.3
Zero correlation: 0
Weak positive correlation: 0.3
Average positive correlation: 0.5
Strong positive correlation: 0.7
Perfect positive correlation: 1

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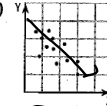


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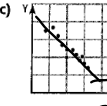
In each of the following cases, the scatter plots contain the same number of points. Four correlation coefficients are given: -0.85; -0.45; 0.25; 0.90. Associate each scatter plot with its corresponding correlation coefficient.



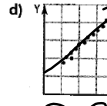
a) 0.25



b) -0.45



c) -0.85



d) 0.9

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ESTIMATING THE CORRELATION COEFFICIENT

$$r = \pm \left(1 - \frac{R}{L}\right)$$

λ

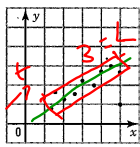
Steps:

1. Draw a line that best passes through the points.
2. Construct the smallest rectangle that contains all the scatter plots point's (ignore any outliers)
3. Identify the long side (L) and short side (R).
4. The correlation coefficient is determined by: $r = \pm \left(1 - \frac{R}{L}\right)$

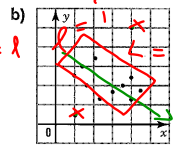
note: the positive or negative depends on the direction the variables vary.

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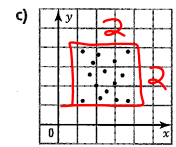
In each of the following cases, estimate the correlation coefficient = r



a) +0.6



b) -0.5



c) =0
No correlation

$$r = \pm \left(1 - \frac{R}{L}\right)$$

$$+ \left(1 - \frac{1}{2}\right) = +0.5$$

$$- \left(1 - \frac{1}{2}\right) = -0.5$$

$$\left(1 - \frac{2}{2}\right) = 0$$

Apr 23-2:03 PM