Correlation Coefficient Worksheet

Algebra 1 · Common Core HSS-ID.C.8

> Compute (using technology) and interpret the correlation coefficient of a linear fit.

Practice

Builds the skill step by step.

1. What does a correlation coefficient of r = 0.95 indicate?
   A. a strong negative relationship
   B. no relationship
   C. a strong positive linear relationship
   D. a weak positive relationship

2. What does r = −0.9 indicate?
   A. no relationship
   B. a strong negative linear relationship
   C. a weak negative relationship
   D. a strong positive relationship

3. What does r close to 0 indicate?
   A. little or no linear relationship
   B. a perfect relationship
   C. a strong negative relationship
   D. a strong positive relationship

4. What values can r take?
   A. from 0 to 100
   B. from 0 to 1
   C. any real number
   D. from −1 to 1

5. Which correlation coefficient shows the strongest linear relationship?

   A. 0.1

   B. -0.92

   C. 0.85

   D. 0.5

6. What does $r = 1$ mean?

   A. All points lie on a horizontal line.

   B. There is no relationship.

   C. The points form a circle.

   D. All points lie exactly on a line with positive slope.

7. Points fall in a tight band from upper left to lower right. Which r is most likely?

   A. -0.95

   B. 0.95

   C. 0

   D. 0.5

8. How is the sign of r related to the line of best fit?

   A. It is unrelated.

   B. It is always positive.

   C. It matches the sign of the slope.

   D. It matches the y-intercept.

9. What does $r = 0.3$ indicate?

   A. a weak positive linear relationship

   B. a strong positive relationship

   C. a weak negative relationship

   D. no relationship at all

10. Data lie exactly on the line $y = 2x + 1$. What is r?

ALBERT

Name _____ Date _____

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On Level

Grade-level practice.

1. What is r for the points (1, 2), (2, 4), (3, 6)?

2. What is r for the points (1, 6), (2, 4), (3, 2)?

3. Does r = 0 mean there is no relationship between the variables?

   A. Only for small data sets.

   B. Yes: always.

   C. Yes: unless r is negative.

   D. No: there may be a nonlinear relationship.

4. Compute r for (1, 1), (2, 3), (3, 2). Use $r = \Sigma(x - \bar{x})(y - \bar{y}) \div \sqrt{(\Sigma(x - \bar{x})^2 \cdot \Sigma(y - \bar{y})^2)}$.

5. Three data sets have r = 0.4, −0.88 and 0.7. For which does a line fit best?

   A. They fit equally well.

   B. r = 0.7

   C. r = −0.88

   D. r = 0.4

6. For a group of students, $r = -0.82$ between hours of video games per week and test scores. Interpret this.

7. How do $r = 0.6$ and $r = -0.6$ compare?

   A. They are identical.

   B. They show equally strong relationships in opposite directions.

   C. 0.6 is stronger.

   D. -0.6 is stronger.

8. How can one outlier affect r?

   A. It always makes r equal to 1.

   B. It only changes the sign.

   C. It never affects r.

   D. It can change r a lot.

9. Compute r for (0, 0), (1, 1), (2, 0).

10. Heights are changed from inches to centimeters. What happens to r between height and weight?

    A. It stays the same.

    B. It is multiplied by 2.54.

    C. It becomes negative.

    D. It becomes 0.

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Challenge

Multi-step and word problems that stretch it.

1. Compute r for (1, 2), (2, 1), (3, 4), (4, 3).

2. Which change does NOT affect r?

   A. removing half of the data

   B. swapping which variable is x and which is y

   C. adding an outlier

   D. replacing points with random values

3. Explain why r = 0 does not mean the variables are unrelated, with an example.

4. Compute r for (−1, 1), (0, 0), (1, 1).

5. Rank r = −0.75, 0.6 and −0.2 from strongest to weakest linear relationship.

   A. −0.75, 0.6, −0.2

   B. 0.6, −0.2, −0.75

   C. −0.2, 0.6, −0.75

   D. 0.6, −0.75, −0.2

6. What r would you expect between people's heights measured in inches and in centimeters?

   A. close to -1
   B. about 0.5
   C. close to 0
   D. very close to 1

7. What is r for the points (2, 10), (4, 6), (6, 2)?

8. Data show r = 0.9 between two variables. Does one cause the other?

   A. Not necessarily: correlation doesn't prove causation.
   B. Yes: r = 0.9 proves it.
   C. Only if r is positive.
   D. Only if the data are large.

9. Which correlation is closer to 0?

   A. -0.3
   B. 0.5
   C. 0.2
   D. -0.9

10. What does r = -0.05 indicate?

    A. a strong negative relationship
    B. almost no linear relationship
    C. a moderate positive relationship
    D. a perfect negative relationship