

Correlation Check

Calculate r and describe a linear association.

HIGH SCHOOL • AI-S.ID.8

AI-S.ID.8 "Calculate (using technology) and interpret the correlation coefficient of a linear fit."

NAME _____

DATE _____

READING CORRELATION

Enter paired x - and y -values into two lists, then use a linear regression or correlation tool to find r . The value of r is from -1 to 1 . Its sign shows direction, and values closer to 1 or -1 show a stronger linear association.

WORKED EXAMPLE

Use the plotted data to find r with a graphing calculator or spreadsheet. Then interpret the result.



1. Enter x : 0, 2, 4 and y : 1, 3, 5.
2. Run a linear regression with r displayed.
3. The calculator gives $r = 1$.
4. A value of 1 means a perfect positive linear association.

Answer: $r = 1$, perfect positive linear association

PRACTICE 4 problems

- 1** Use technology to find r for (10, 15), (20, 25), and (30, 35).

ANSWER _____

- 2** Use technology to find r for (10, 35), (20, 25), and (30, 15).

ANSWER _____

- 3** Use technology to find r for (10, 20), (20, 40), and (30, 20). State the linear association.

ANSWER _____

- 4** Use technology to find r for (10, 30), (20, 10), and (30, 20). State the direction and strength.

ANSWER _____

APPLY IT Show your work

- 1** A gaming club records practice rounds and scores in a timed challenge. Find r and interpret it.

TIMED CHALLENGE RESULTS

Practice rounds	Score
10	50
20	55
30	60
40	65

ANSWER _____

- 2** Over three days, a student records phone notifications and a focus rating: (8, 9), (16, 5), and (24, 7). Find r and interpret it.

WORK SPACE

ANSWER _____

CHALLENGE One step up

For (12, 4), (14, 0), (16, 0), and (18, 4), technology gives $r = 0$. Explain why $r = 0$ does not mean the variables have no relationship.

WORK SPACE AND ANSWER

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Use technology to find r for (10, 15), (20, 25), and (30, 35).	$r = 1$
2	Use technology to find r for (10, 35), (20, 25), and (30, 15).	$r = -1$
3	Use technology to find r for (10, 20), (20, 40), and (30, 20). State the linear association.	$r = 0$; no linear association
4	Use technology to find r for (10, 30), (20, 10), and (30, 20). State the direction and strength.	$r = -1/2$; moderate negative linear association

PART 2 • APPLY IT

1. $r = 1$; perfect positive linear association Enter practice rounds as x and scores as y . The data lie exactly on an increasing line, so $r = 1$.
2. $r = -1/2$; moderate negative linear association Enter notifications as x and focus rating as y . The correlation is -0.5 , which indicates a moderate negative linear association.

CHALLENGE

$r = 0$. As x increases, y decreases and then increases, so the data have a U-shaped nonlinear pattern. Correlation measures linear association only.

Accept $1/2$ or 0.5 , and $-1/2$ or -0.5 . Accept equivalent descriptions of direction and strength, including no linear relationship for $r = 0$.