

Patterns on Point

Use lines to describe data patterns.

GRADE 8 • 8.SP.A

CCSS.Math.Content.8.SP.A "Investigate patterns of association in bivariate data."

NAME _____

DATE _____

READ THE PATTERN

On a scatter plot, a positive association means y tends to rise as x rises, and a negative association means y tends to fall as x rises. A line of fit estimates y with $y=mx+b$. The slope m tells how y changes for each increase of 1 in x .

WORKED EXAMPLE

A line of fit is $y=5x-2$. Estimate y when $x=8$.

1. Substitute $x=8$: $y=5(8)-2$.
2. Multiply: $5(8)=40$.
3. Subtract: $40-2=38$.

Answer: $y=38$

PRACTICE 6 problems

- 1** The line of fit $y=3x+4$ models a data set. Estimate y when $x=6$.

ANSWER _____

- 2** The line of fit $y=-3x+19$ models a data set. Estimate y when $x=4$.

ANSWER _____

- 3** A line of fit is $y=4x+6$. What does the slope tell you about the association?

ANSWER _____

- 4** The table shows paired data. x : 1, 3, 6, 9 y : 16, 14, 11, 9 Describe the association as positive or negative.

ANSWER _____

- 5** A line of fit is $y=4x+1$. A data point is (3, 14). Find the residual, actual y minus predicted y .

ANSWER _____

- 6** A line of fit predicts $y=20$ when $x=6$. An actual data point has $x=6$ and $y=24$. Is the point above or below the line? Find its residual, actual y minus predicted y .

ANSWER _____

APPLY IT Show your work

- 1** During basketball tryout week, x is the number of days of practice and y is the number of baskets made in a ten-minute shooting drill. A line of fit is $y=3x+16$. Estimate the number of baskets on day 7. If the player actually makes 34 baskets, find the residual, actual minus predicted.

WORK SPACE

ANSWER _____

- 2** A student tracks phone battery remaining, y , after x hours without charging. A line of fit is $y=94-6x$. Estimate the battery remaining after 7 hours. What does the slope mean in this situation?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Two clubs record x and y values. For both clubs, $y=4x+7$ is a proposed line of fit. Club A: (1, 11), (2, 15), (3, 19), (4, 23) Club B: (1, 10), (2, 18), (3, 16), (4, 25) Which club has the stronger linear association? Explain using residuals, where residual means actual y minus predicted y .

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	The line of fit $y=3x+4$ models a data set. Estimate y when $x=6$.	$y=22$
2	The line of fit $y=-3x+19$ models a data set. Estimate y when $x=4$.	$y=7$
3	A line of fit is $y=4x+6$. What does the slope tell you about the association?	For every increase of 1 in x, y increases by 4 units.
4	The table shows paired data. x : 1, 3, 6, 9 y : 16, 14, 11, 9 Describe the association as positive or negative.	Negative association.
5	A line of fit is $y=4x+1$. A data point is (3, 14). Find the residual, actual y minus predicted y .	1
6	A line of fit predicts $y=20$ when $x=6$. An actual data point has $x=6$ and $y=24$. Is the point above or below the line? Find its residual, actual y minus predicted y .	Above the line; residual = 4.

PART 2 • APPLY IT

- Predicted: 37 baskets. Residual: -3 baskets.** Substitute 7 for x to get $3(7)+16=37$. The residual is $34-37=-3$, so the player made 3 fewer baskets than predicted.
- 52% remaining. The battery is predicted to decrease by 6 percentage points each hour.** Substitute 7 for x to get $94-6(7)=52$. The slope of -6 means the predicted battery percentage drops by 6 points for each additional hour.

CHALLENGE

Club A has the stronger linear association. Its residuals are 0, 0, 0, 0 because every point is on the line. Club B's residuals are -1, 3, -3, 2, so its points are farther from the line and vary more.

Accept equivalent wording for positive and negative association and for slope interpretations. For residuals, accept only values found by actual y minus predicted y , as stated in the prompts.