

Trend Line Detectives

Sketch and evaluate lines that summarize scattered data

GRADE 8 • 8.PS.3.f

8.PS.3.f "Sketch the line of best fit for data represented in a scatterplot."

NAME _____

DATE _____

BUILD UNDERSTANDING

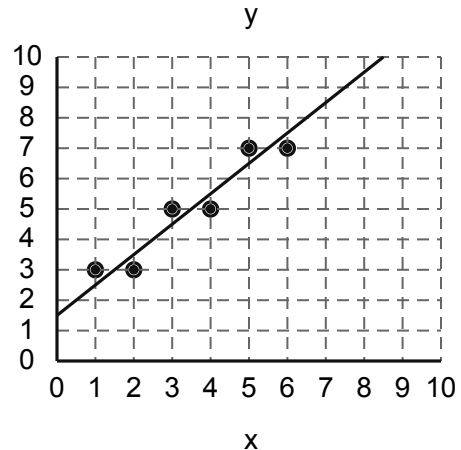
Use a ruler. Sketch a straight line through the middle of a roughly linear cloud. Consider the direction, vertical gaps and balance of points on each side; do not merely connect the dots. Reasonable hand fits can differ. An unusual point deserves attention without automatically erasing the main trend.

WORKED EXAMPLE

Observe the points and the drawn line. Explain why it is a reasonable fit.

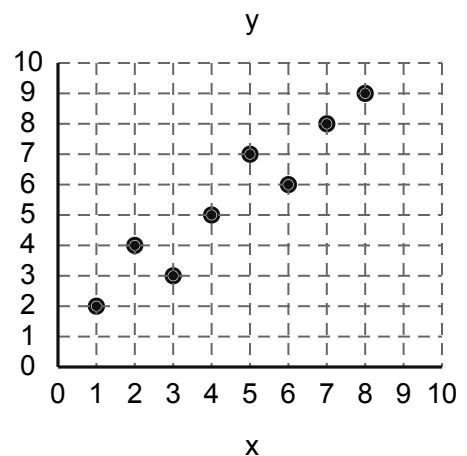
1. A fit summarizes the overall direction, not the path between consecutive dots.
2. Three points lie above and three below this line, with small vertical gaps.

Answer: The line $y = x + 1.5$ follows the center of the upward cloud.

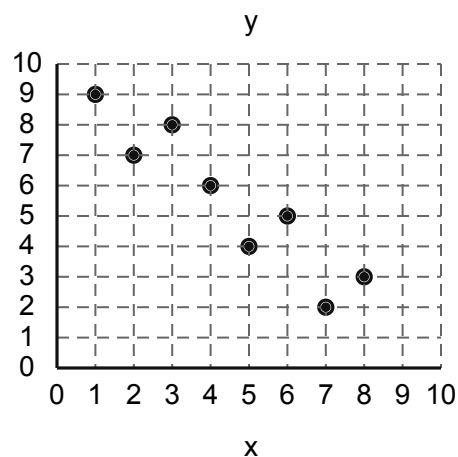


PRACTICE 4 problems

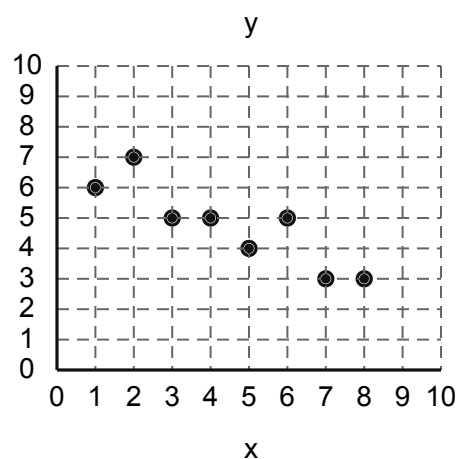
- 1 Sketch a straight line of best fit. Mark two locations on your line and explain why it represents the cloud.



- 2** Sketch a line of best fit for this decreasing cloud.
Explain why joining every dot is not the same task.



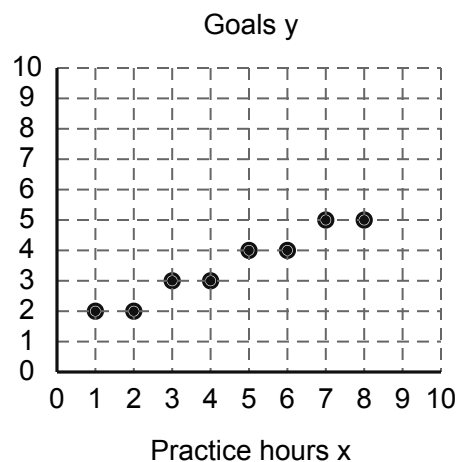
- 3** Sketch a fit line for this cloud. Check the gaps above and below your line, then revise it if needed.



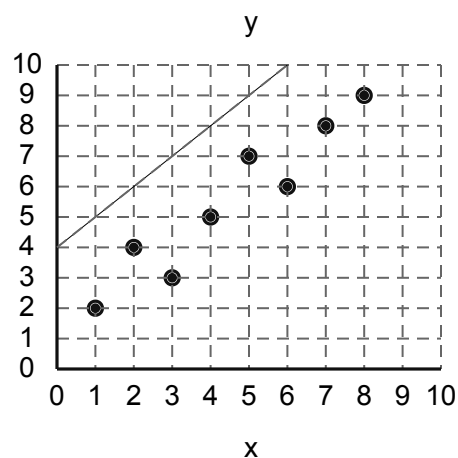
- 4** A student says a best-fit line must pass through $(0, 0)$. Explain whether that is always true. Use one earlier scatterplot to support your answer.

APPLY IT Show your work

- 1** These simulated data compare practice hours x and goals y . Sketch a fit line and use it to estimate goals at 6 hours. Explain why your result is an estimate.

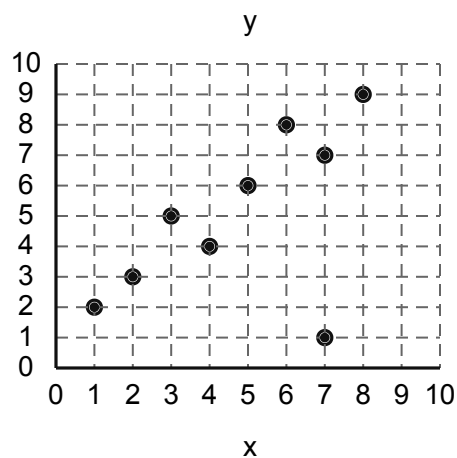


- 2** The dashed trial line is $y = x + 4$. Sketch a better fit on this graph. Explain the change using where the data points fall.



CHALLENGE One step up

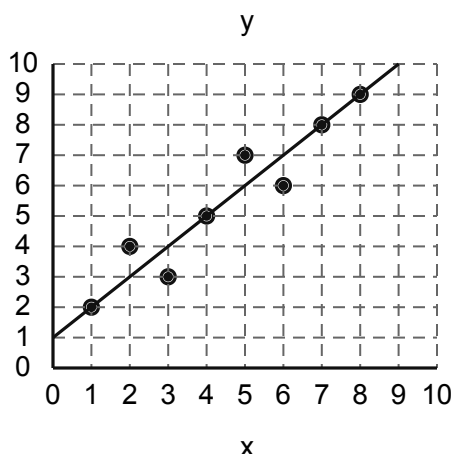
Sketch a fit line for this upward cloud with one unusual point. Explain why your line summarizes the main pattern and why an exact line through every point is impossible.



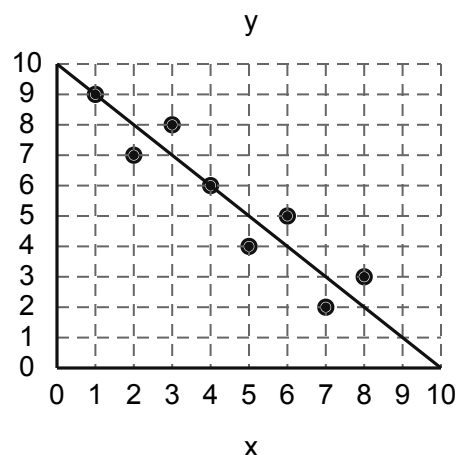
Require the six student-sketched fit lines. Equations in this key describe example lines and are not required from students. Accept reasonable alternative fits and predictions supported by those fits. All datasets are simulated. Practice 4 is a conceptual check; the challenge emphasizes the main cloud rather than requiring a particular regression convention.

PRACTICE 1

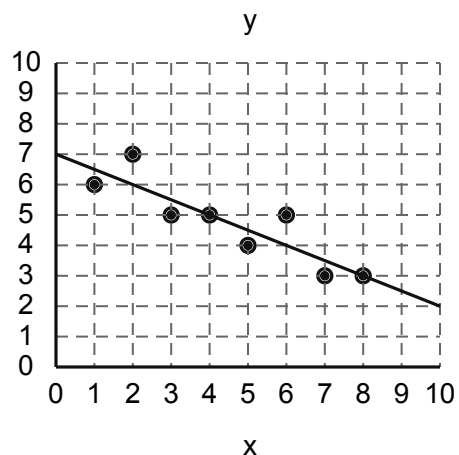
Example fit $y = x + 1$, through (1, 2) and (8, 9); two points lie above and two below it.

**PRACTICE 2**

Example fit $y = -x + 10$; it follows the downward center. Joining dots gives a zigzag path.

**PRACTICE 3**

One reasonable line is $y = -(1/2)x + 7$. It follows the downward cloud with points on both sides.

**PRACTICE 4**

No. For Practice 2, the downward cloud is centered near $y = -x + 10$, which crosses the y-axis near 10, not 0.

APPLY IT 1

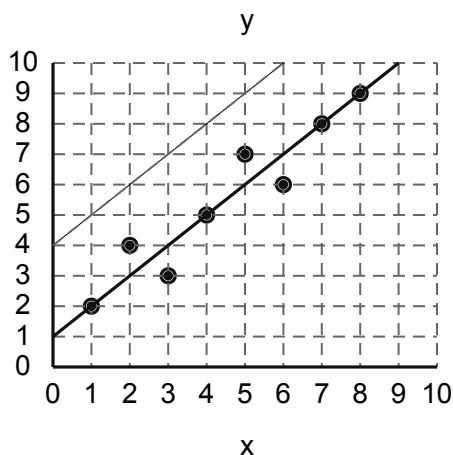
Example fit $y = (1/2)x + 5/4$ gives about 4.25 goals, or roughly 4 goals, at 6 hours.

Actual observations scatter around the model, so a prediction is not guaranteed and may be fractional before rounding.



APPLY IT 2

Move the fit downward; $y = x + 1$ is reasonable. The dashed trial line lies above every observation. A fit should track the cloud's center, rather than leave all the dots below it.



CHALLENGE

A fit near $y = x + 1$ follows the main upward cloud; (7, 1) is unusual. No single straight line contains all nine points.

