

Spot the Pattern

Contrast straight trends, curves and scattered data.

GRADE 8 • TEKS 8.5.C

8.5.C "contrast bivariate sets of data that suggest a linear relationship with bivariate sets of data that do not suggest a linear relationship from a graphical representation;"

NAME _____

DATE _____

Connect the representations

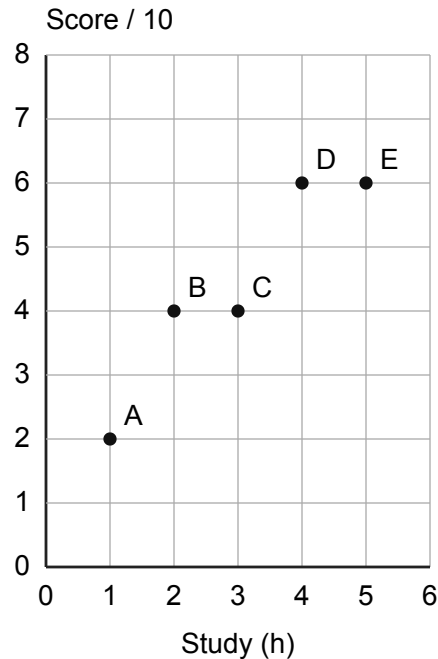
Bivariate data pair two quantities. A linear relationship is suggested by points on or near one straight line; exact equal differences are not necessary. Curves and widely scattered points call for different interpretations. Inspect the whole plot and keep observations as separate dots.

Worked example

These points show study hours and scores out of 10. Do the data suggest a linear relationship? Describe the overall pattern, not just exact differences.

Look across the whole plot: greater study time generally goes with a higher score. Points are close to one straight rising pattern; a perfect line is not required. This does not prove study time caused the scores.

Yes: a rising, roughly straight band. The data are approximately linear, even though successive rises differ.



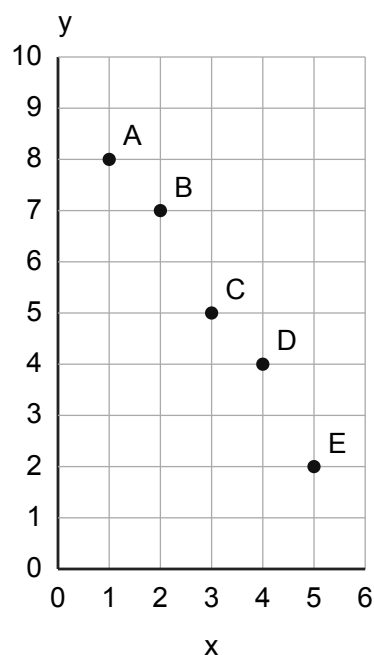
Use the stated variables, units and graph intervals. Plot only when asked. Label points clearly and use the response lines for equations, tables and explanations.

1. Practice

A student rejects the worked data because B and C share a score. Identify the other two points with a shared score. Explain why these short horizontal pairs do not rule out an overall linear trend.

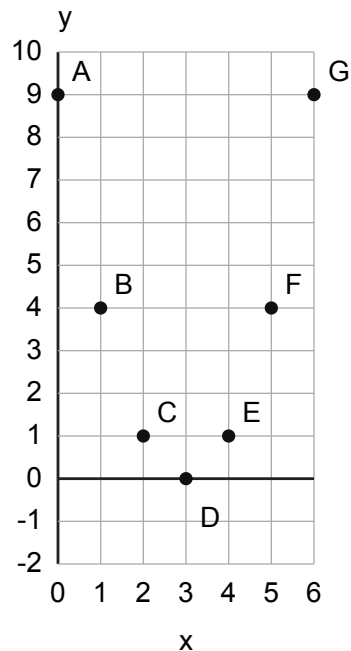
2. Practice

Describe the overall pattern in this scatter plot. Does it suggest a linear relationship? Compare its direction with the worked plot.

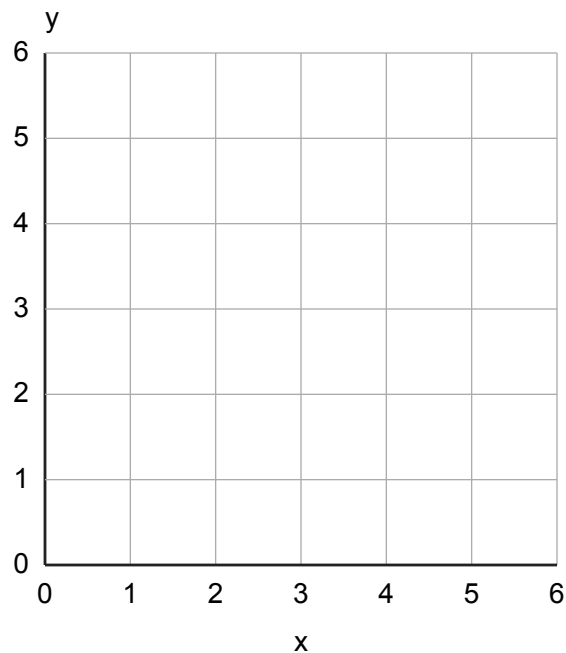


3. Practice

Inspect the plotted data. Could one straight line describe the whole pattern well? Compare this graph with Task 2 and explain what the change in direction means.

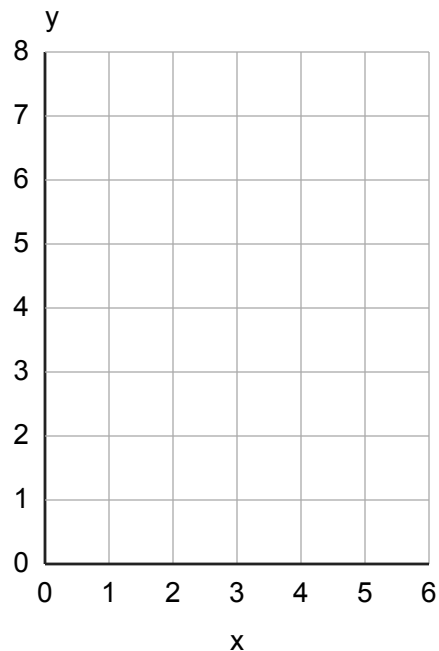
**4. Practice**

Plot $(1,1)$, $(2,3)$, $(3,3)$, $(4,5)$, $(5,5)$ on the grid. Do not join the dots. Compare the resulting pattern with Task 3: which is better described by one straight line?



5. Apply

Plot $(1,2)$, $(1,6)$, $(3,2)$, $(3,6)$, $(5,2)$, $(5,6)$. Keep the dots separate. Compare with Task 4: does a clear increasing or decreasing linear association appear?

**6. Apply**

Compare Tasks 2, 3 and 5. Match each to a falling linear trend, a curved relationship, or no clear increasing/decreasing association. Explain why the last two are different from each other.

7. Challenge

A student says, "Nonlinear data have no relationship, and uneven rises rule out a linear trend." Use actual plots from this sheet to correct both claims.

Accept equivalent correct reasoning. Check plotted points and constructed representations as well as written answers. Numbered solutions match the student tasks.

Task 1

D(4,6) and E(5,6) also share a score. Local horizontal pairs are compatible with an overall rising band. Approximately linear data need not increase by an identical amount at every step.

Task 2

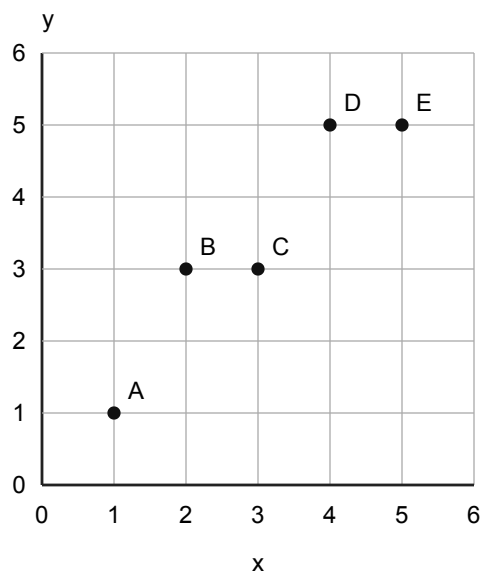
It suggests an approximately linear decreasing relationship: points form a falling band near one straight line. The worked plot rises instead.

Task 3

No: this set forms a U-shaped curve, falling and then rising. Task 2 follows one falling band; this graph has a nonlinear pattern.

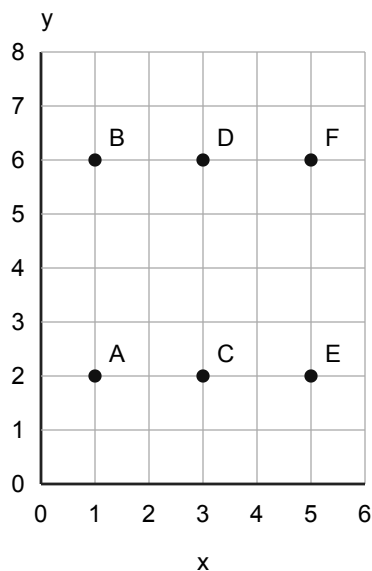
Task 4

Plot all five points separately. This plot forms a roughly straight rising band and is better described by a line than the U-shaped pattern in Task 3.



Task 5

Plot all six pairs. No clear increasing or decreasing association appears: each x has both $y = 2$ and $y = 6$. Task 4 shows a rising linear trend.

**Task 6**

Task 2: falling linear trend; Task 3: curved relationship; Task 5: no clear increasing/decreasing association. A clear curve still relates the variables, while Task 5 has no comparable directional pattern.

Task 7

Task 3 has a clear curved relationship, unlike the nondirectional scatter in Task 5. Task 4 and the worked data have uneven rises but follow roughly straight bands. Nonlinear does not mean unrelated.