Scatter Plots and Patterns in Data

Explore ideas and representations

Name _____ **Date** _____ **Score** _____ / 6

QUICK REVIEW

A scatter plot represents paired measurements, not connected stages of one trip. Positive association means larger x values tend to accompany larger y values; negative association means they tend to accompany smaller ones. Describe direction, approximate shape, clusters, and outliers separately. For points near $(2, 5)$ and $(8, 17)$, the overall rise suggests positive association, not proof of causation.

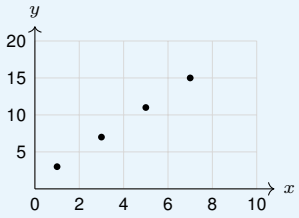
Worked example

Example for form 1: describe this trend.

1. Compare $(1, 3)$ and $(7, 15)$: the input increases by 6 and the output by 12. The endpoint rate is $12/6 = 2$.

2. The middle points follow the same upward band. Thus the association is positive and approximately linear; the paired observations do not by themselves prove causation.

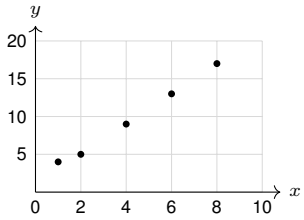
Answer: Positive, approximately linear association.



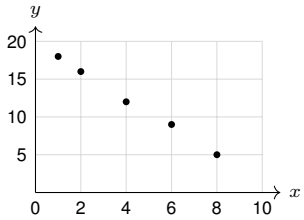
Practice Problems

Show your thinking.

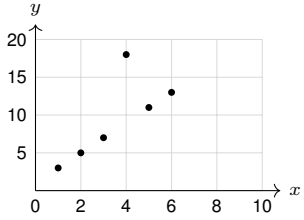
1. Describe the direction and approximate shape of this pattern.



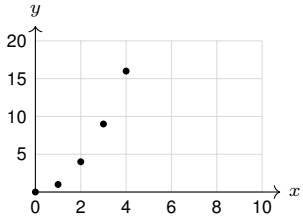
2. Classify the direction of association and cite two plotted points.



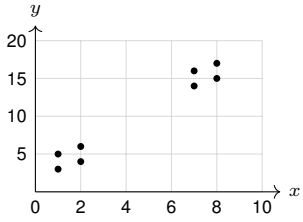
3. Identify the point farthest above the main linear pattern.



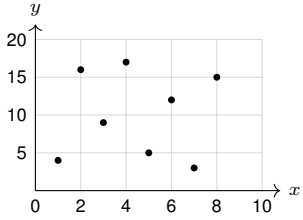
4. Describe the shape: should one straight line summarize it well?



5. Name the two visible clusters by approximate x-ranges.



6. Read the observation at x=6, then say whether a clear upward or downward trend appears.



Answer Key

1. Positive, approximately linear.
2. Negative association.
3. $(4, 18)$
4. Curved, positive; one line is not a good summary.
5. Clusters at $x = 1$ to 2 and $x = 7$ to 8.
6. At $x = 6$, $y = 12$; no clear direction.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. As x rises from 1 to 8, the observed y values rise from 4 to 17. Points near $x = 4, 6$ have $y = 9, 13$.

2. The points follow an upward, nearly straight band rather than a curve. This is positive, approximately linear association.

Problem 2

1. The plot includes $(1, 18)$ and $(8, 5)$. Over that span, x increases by 7 while y decreases by 13.

2. The middle points also descend, for example $(4, 12)$ and $(6, 9)$. The overall downward pattern is negative association, not a rising relationship.

Problem 3

1. The main points follow $y = 2x + 1$: at $x = 3$ and $x = 5$, outputs are 7 and 11. At $x = 4$ this pattern predicts 9.

2. The actual point is $(4, 18)$, which is $18 - 9 = 9$ units above that pattern. It is the clear high outlier.

Problem 4

1. At consecutive inputs $0, 1, 2, 3, 4$, outputs are $0, 1, 4, 9, 16$. The rises are $1, 3, 5, 7$.

2. The increasing rises produce an upward curve, not a constant-slope band. Association is positive over these inputs but nonlinear.

Problem 5

1. Four points have inputs 1 or 2 and outputs from 3 to 6. Four more have inputs 7 or 8 and outputs from 14 to 17.

2. There are no observations between $x = 2$ and $x = 7$. This gap separates two clusters; it is not a continuous band of measured values.

Problem 6

1. Locate $x = 6$ on the horizontal scale; its point has height 12. Nearby outputs include 5 at $x = 5$ and 3 at $x = 7$.

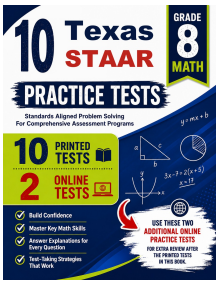
2. High and low outputs occur at both small and large inputs. There is no consistent upward or downward pattern, despite the particular reading $(6, 12)$.

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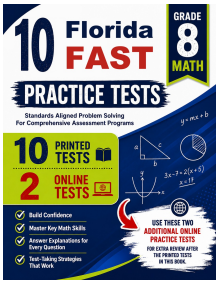
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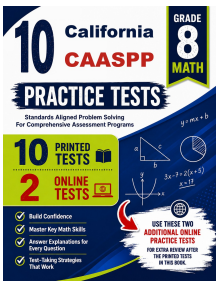
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