LESSON MAKER PRO

Spot the Shift

Find patterns and points that change a trend.

HIGH SCHOOL · S.DA.4.3

S.DA.4.3 "Analyze scatter plots for patterns, linearity, outliers, and influential points."

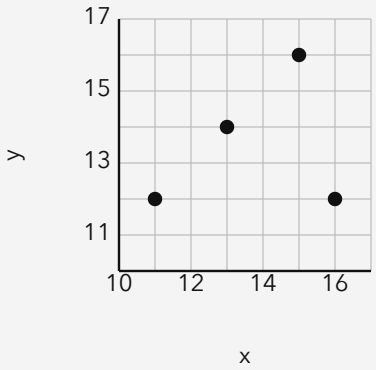
NAME _____ DATE _____

READ THE PATTERN

Points that form a roughly straight band show a linear pattern. A point far from the band may be an outlier; to see whether it changes an endpoint trend line, compare the line's slope with and without that point.

WORKED EXAMPLE

Does the point at the far right change the slope of the endpoint trend line?



1. Without the far-right point, the endpoints are (11, 12) and (15, 16).
2. Their slope is (16 - 12)/(15 - 11) = 1.
3. With that point, the endpoints are (11, 12) and (16, 12). Their slope is (12 - 12)/(16 - 11) = 0.

Answer: Yes. The endpoint slope changes from 1 to 0.

PRACTICE 4 problems

1 Find the slope through (0, 2) and (4, 6).

ANSWER _____

2 Are (0, 3), (2, 5), and (4, 7) linear? Give their slope.

ANSWER _____

3 A trend line is y = x + 2. Find the vertical distance from the line to (6, 3).

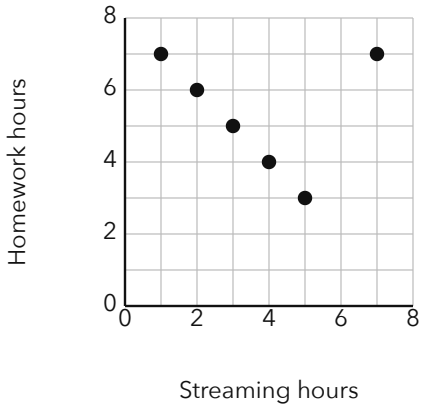
ANSWER _____

4 An endpoint line runs from (0, 2) to (4, 6). Replace its second endpoint with (8, 2). Find the new slope.

ANSWER _____

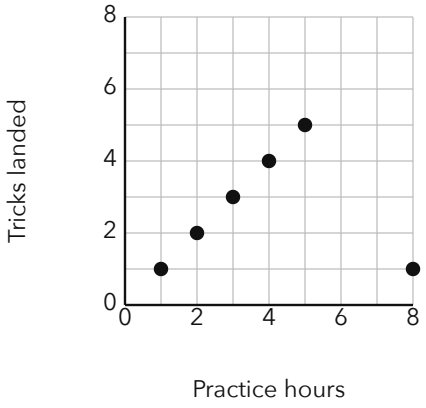
APPLY IT Show your work

1 This plot shows six students' daily streaming time and homework time. Name the outlier and describe the pattern among the other points.



ANSWER _____

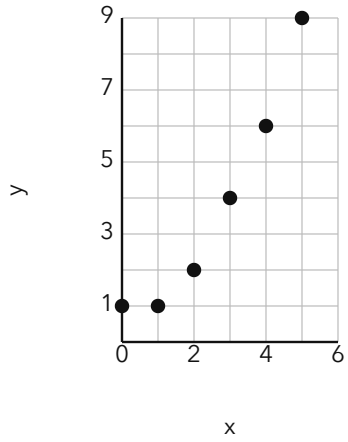
2 The plot shows practice hours and tricks landed by six skaters. Find the endpoint line's slope with and without (8, 1). Is that point influential for the endpoint line?



ANSWER _____

CHALLENGE One step up

A student calls the far-right point an outlier because it is far from the far-left point. Does the full plot support that claim? Explain the pattern.



WORK SPACE AND ANSWER

ANSWER KEY

Spot the Shift

HIGH SCHOOL · S.DA.4.3

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Find the slope through (0, 2) and (4, 6).	**1**
2	Are (0, 3), (2, 5), and (4, 7) linear? Give their slope.	**Yes. The slope is 1.**
3	A trend line is y = x + 2. Find the vertical distance from the line to (6, 3).	**5**
4	An endpoint line runs from (0, 2) to (4, 6). Replace its second endpoint with (8, 2). Find the new slope.	**0**

PART 2 · APPLY IT

1. **(7, 7) is the outlier. The other points show a negative linear pattern.** The first five points fall on a line that slopes downward. The point (7, 7) lies far above that line.
2. **The slope is 0 with (8, 1) and 1 without it. Yes, it is influential for the endpoint line.** With the point, the endpoint slope is (1 - 1)/(8 - 1) = 0. Without it, the slope is (5 - 1)/(5 - 1) = 1.

CHALLENGE

No. The points follow an increasing, curved pattern, and the far-right point continues that pattern.

Accept "downward trend" for negative linear pattern. In the challenge, accept any explanation that the far-right point fits the curved pattern rather than departing from it.