Lines of Best Fit Worksheet

Grade 8 · Common Core 8.SP.A.2

> Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.

Practice

Builds the skill step by step.

1. Which is true of a good line of fit for a scatter plot?

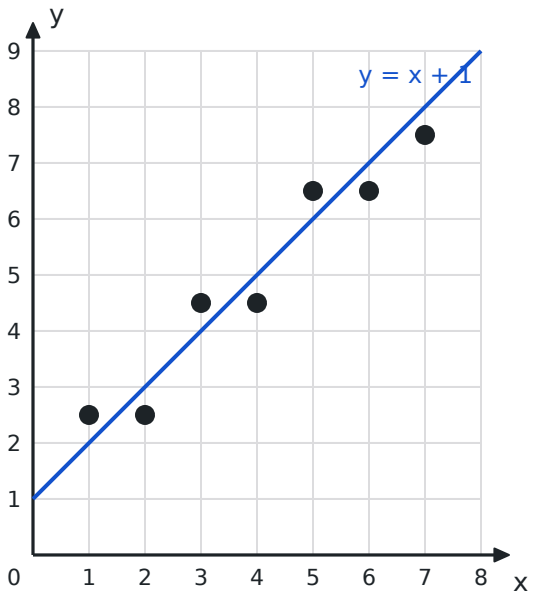
   A. It has roughly as many points above it as below it, and the points are close to it.

   B. It must pass through every point.

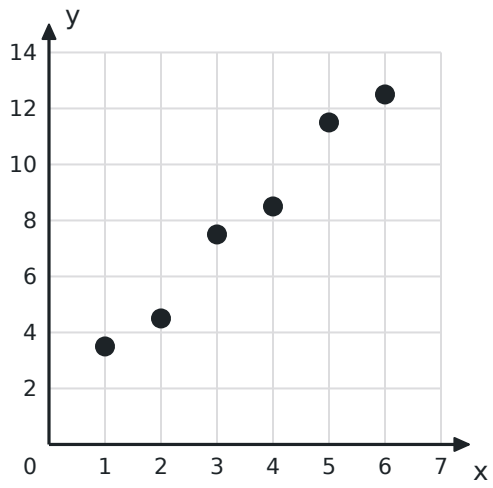
   C. It must pass through the first and last points.

   D. It must go through the origin.

2. A line of fit, y = x + 1, is drawn on the scatter plot. How many points lie above the line?



3. Which line would be the best line of fit for the scatter plot?



A. $y = -x + 8$

B. $y = 5$

C. $y = 0.5x$

D. $y = 2x + 1$

4. A line of fit passes through (0, 2) and (4, 10). What is its slope?

5. A line of fit is $y = 2x + 1$. How far above the line is the data point (3, 9)?

6. A scatter plot shows no association between two quantities. Is a line of fit useful for making predictions?

A. Yes, but only a horizontal line.

B. No, because the points don't follow a linear trend.

C. No, because there are too many points.

D. Yes, any line can be used.

7. A line of fit passes through (0, 50) and (10, 90). Write its equation in the form $y = mx + b$.

8. A line of fit for a set of data is y = 3x + 10. What y-value does it predict when x = 5?

9. For which kind of scatter plot is a straight line of fit a good model?

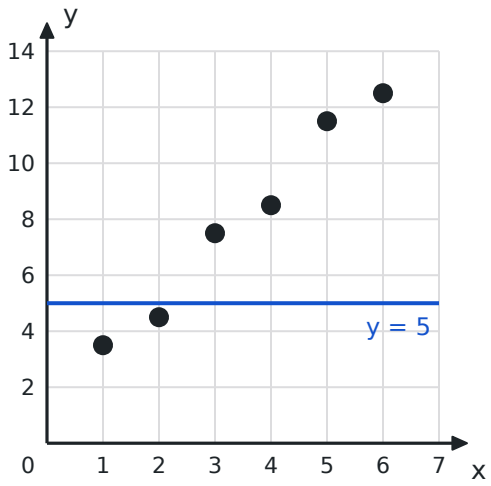
   A. One whose points form two far-apart clusters

   B. One with no association

   C. One whose points rise or fall along a roughly straight path

   D. One whose points follow a curve

10. The line y = 5 is drawn on the scatter plot as a line of fit. Is it a good fit? Answer Yes or No.



ALBERT

Name _____ Date _____

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On Level

Grade-level practice.

1. The data points are (1, 3), (2, 5), (3, 7) and (4, 9). Line A is $y = 2x + 1$ and line B is $y = 2x$. Which line fits better? Answer Line A or Line B.

2. A line of fit for hours worked (x) and dollars earned (y) passes through (2, 30) and (8, 60). Write its equation in the form $y = mx + b$.

3. A student's line of fit has 7 data points above it and only 1 below it. What is the most likely problem?

   A. The line is too high.

   B. The line fits well.

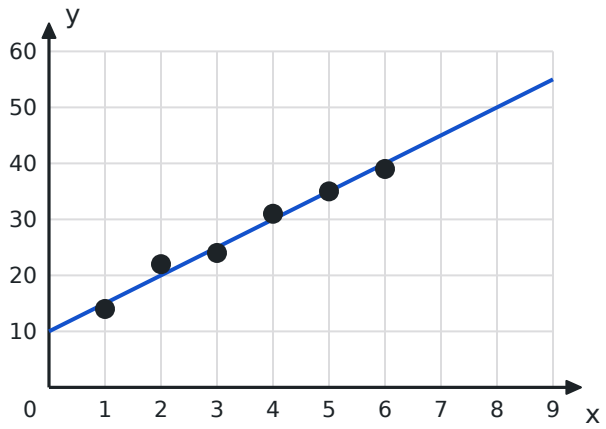
   C. The line is too low.

   D. The slope should be negative.

4. The line of fit is $y = x + 2$. The data points are (1, 4), (2, 3), (3, 6) and (4, 5). What is the total of the vertical distances from the points to the line?

5. Explain how you can judge whether a straight line is a good fit for a scatter plot.

6. A line of fit through (0, 10) and (5, 35) is drawn on the scatter plot. What does the line predict for x = 8?



7. A scatter plot's points rise slowly at first and then more and more steeply. Would a straight line be a good model?

   A. Yes, any positive data can use a straight line.

   B. No, because the points follow a curve.

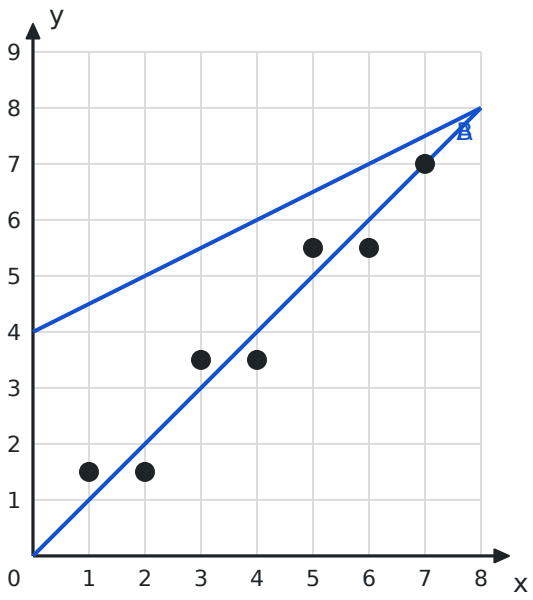
   C. No, because the association is negative.

   D. Yes, because the association is positive.

8. The line of fit is $y = -2x + 40$. How many of the data points (2, 37), (5, 29), (8, 25) and (10, 19) lie above the line?

9. A line of fit passes through (10, 62) and (30, 72). What is its slope?

10. Two lines are drawn on the scatter plot: line A is y = x and line B is y = 0.5x + 4. Which statement is true?



A. Line A fits better; its points are close on both sides.

B. Line B fits better; it is less steep.

C. They fit equally well.

D. Neither line can be a line of fit.

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Challenge

Multi-step and word problems that stretch it.

1. A line of fit passes through (2, 5) and (6, 13). Write its equation in the form y = mx + b.

2. The data points are (1, 3), (2, 4), (3, 7) and (4, 8). Line A is y = 2x and line B is y = 2x + 1. Which line has the smaller total vertical distance to the points? Answer Line A, Line B or Equal.

3. Ty draws his line of fit through the first and last data points only. What is the problem with this method?

   A. Those two points may not represent the trend; the line should balance all the points.

   B. There is no problem; that always gives the best line.

   C. A line of fit must pass through the origin.

   D. The line should pass through the two highest points.

4. A line of fit for hours (x) and dollars (y) is y = 1.5x + 20. One data point is (10, 50). How far is it from the line, and is it above or below?

5. Two students draw different lines of fit for the same scatter plot. Can both be reasonable? Explain.

6. The data points are (0, 2), (1, 4), (2, 6), (3, 8) and (4, 20). A line of fit should follow the trend of most of the points. Which point does not fit the trend?

7. A line of fit passes through (1, 2.5) and (5, 4.5). Write its equation in the form $y = mx + b$.

8. The points on a scatter plot are spread far above and below a line of fit, though the line follows the general trend. How would you describe the fit?

   A. A strong fit, because points are on both sides.

   B. Not a fit at all, because no points are on the line.

   C. A weak fit: the line shows the trend, but predictions may be far off.

   D. A perfect fit, because the line follows the trend.

9. A line of fit is $y = -0.5x + 30$. For what x-value does it predict $y = 20$?

10. The data points are (0, 4), (2, 8), (4, 13), (6, 16) and (8, 20). Which line has the smaller total vertical distance to the points: $y = 2x + 4$ or $y = 2x + 5$?