Math Worksheet for 8th Grade

Estimating lines of best fit

Name: Due Date: Teacher: Parent Sign:

Questions

1. Given points (1, 2), (2, 4), (3, 5), (4, 8). Use points (1,2) and (4,8) to estimate the line of best fit. What is its equation?

2. Given points (0,1), (2,3), (4,5). Find the equation of the line passing through (0,1) and (4,5).

3. Points: (1,3), (2,4), (3,5), (4,6). Estimate the line of best fit (give equation).

4. Points: (1,5), (3,7), (5,9). Find the equation of the line through (1,5) and (5,9).

5. Points: (0,0), (2,1), (4,2). Estimate the line of best fit (equation).

6. Points: (1,10), (2,8), (3,6), (4,4). Estimate the best-fit line using (1,10) and (4,4). What is the equation?

7. Points: (0,5), (1,6), (2,8), (3,9). Use (0,5) and (3,9) to find the line equation (rounded to two decimal places if needed).

8. Points: (2,3), (4,7), (6,11). Find the equation of the line through (2,3) and (6,11).

9. Points: (1,1), (2,2.5), (3,4), (4,5.5). Estimate the line passing near (1,1) and (4,5.5). Give its equation.

10. Points: (0,2), (5,7). Find the equation of the line through these two points.

11. For the line y = 2x (from a previous estimate), predict y when x = 6.

12. For the line y = x + 1, predict y when x = 10.

13. For the line y = 0.5x, predict y when x = 14.

14. For the line y = -2x + 12, predict y when x = 5.

15. For the line y = 1.5x - 0.5, predict y when x = 8.

16. (Smoking example dataset) Year vs cigarettes per person per year: (1930, 1000), (1940, 1200), (1950, 1400). Find the slope (rate of change of cigarettes per person per year).

17. Using the dataset in Q16, write the equation of the trend line in the form y = mx + b (use x = year).

18. Using the trend line from Q17, estimate the cigarettes per person per year in 1945.

19. If the actual, measured value in 1945 was 1350, compute the residual (actual - predicted) using your answer from Q18.

20. Interpret the slope from Q16 in words (one short sentence).

21. Given two points (2000, 50) and (2010, 80) representing average hours online per year vs year, find the slope (change per year).

22. Using the points in Q21, write the line equation y = mx + b. (Use x = year.)

23. Using the line from Q22, predict y for x = 2005.

24. Points: (1, 4), (3, 10). Find the equation of the line through these points.

25. For the line from Q24, find y when x = 2.

26. Given points (2, 6) and (5, 0), compute the slope and the equation of the line through them.

27. For the line y = -2x + 10, compute the predicted y at x = 3 and the residual if the actual y was 4.

28. Points: (0, 4), (4, 12), (8, 20). Find the slope of the trend and the equation of the line using (0,4) and (8,20).

29. Using the line from Q28, predict y when x = 6.

30. Points: (1, 2), (2, 3), (3, 6). Estimate the best-fit line by using points (1,2) and (3,6). What is the equation?

31. Given scatter points showing a steady upward pattern, a line of best fit has slope 3. What does that slope mean in context (short numeric interpretation)?

32. If a trend line is y = 4x - 1 and x increases by 5 units, how much does y increase?

33. Two possible trend lines for the same data are y1 = 2x + 3 and y2 = 2.5x + 1. For x = 4, which line predicts a larger y and by how much?

34. Given points (10, 30) and (14, 42), find the line through them (slope and intercept).

35. For the line y = 5x - 10, predict y at x = 3 and at x = 0.

36. Points: (0, 7), (7, 0). Find the equation of the line and predict y at x = 2.

37. Points: (1, 1), (2, 4), (3, 7), (4, 10). The points look roughly linear. Use (1,1) and (4,10) to find an estimated trend line (equation).

38. For the line from Q37, compute predicted y at x = 2.5.

39. Given a trend line y = -0.5x + 8, what is y when x = 6? Is the relationship positive or negative?

40. A line of best fit is y = 0.2x + 5. If a data point at x = 10 has actual y = 7, compute the residual (actual - predicted).

41. Points: (1, 10), (2, 9), (3, 8), (4, 7). What is the slope of the trend? Is the correlation positive or negative?

42. Points: (0, 0), (2, 1), (4, 2), (6, 3). What is the slope and intercept of a best-fit line through (0,0) and (6,3)?

43. If the slope of a trend line is 0, what does the scatter of points look like (short numeric description)?

44. Two points on a trend are (3, 15) and (8, 30). Find the slope and equation. Then predict y when x = 10.

45. Given trend line y = 3x + 2, for which x does y = 20? (Solve for x.)

46. Points: (0, 12), (4, 4). Find the equation of the line through these points and predict y at x = 2.

47. Points: (2, 20), (6, 12). Find slope and equation. Interpret the slope in one short numeric sentence.

48. For line y = 1.25x + 3, compute y when x = 8 and compute the residual if actual y = 13.

49. Two estimated lines for a dataset are y = x + 5 and y = 0.8x + 6. For x = 10, compute both predicted y values and state which line predicts higher.

50. A trend line from data is y = -4x + 50. If x increases from 3 to 6, by how much does y change? What is the new y at x = 6?