

Algebra I
 Ch. 6 Review
 Lines of Best Fit
 Linear Regression
 Correlation Coefficients

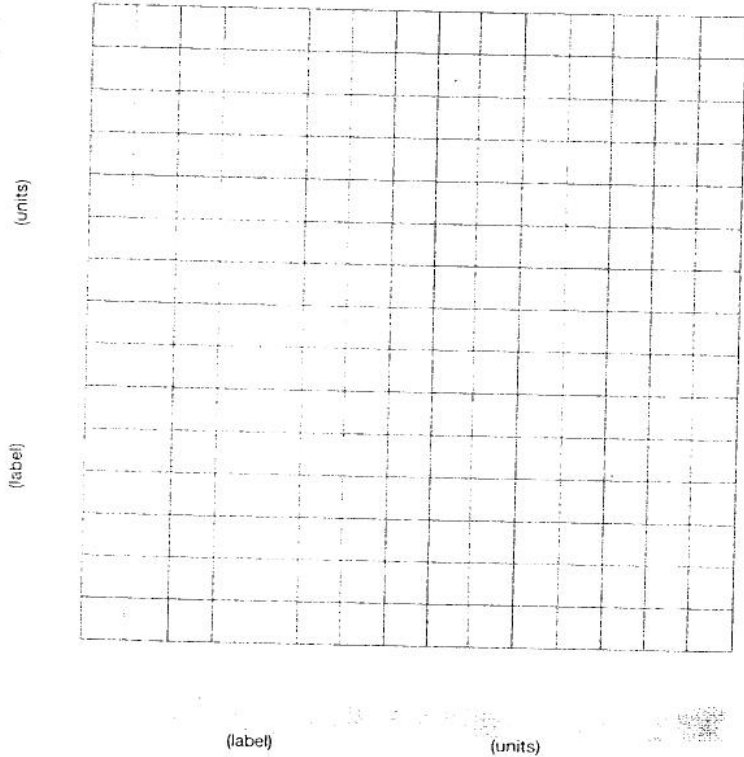
NAME: _____
 DATE: _____ HOUR: _____

The data in the table show the relationship between a runner's average speed and the average number of steps the runner takes each second.

Speed	Steps
feet per second	steps per second
16.00	3.00
17.00	3.10
17.50	3.20
18.50	3.25
20.00	3.40
21.00	3.50
22.00	3.60
23.00	3.75
24.00	3.80
24.50	3.90

Variable quantity	Lower bound	Upper bound	Interval
Speed x	0	30	2
Steps y	1	4	.2

Create a scatter plot of the ordered pairs on the grid.

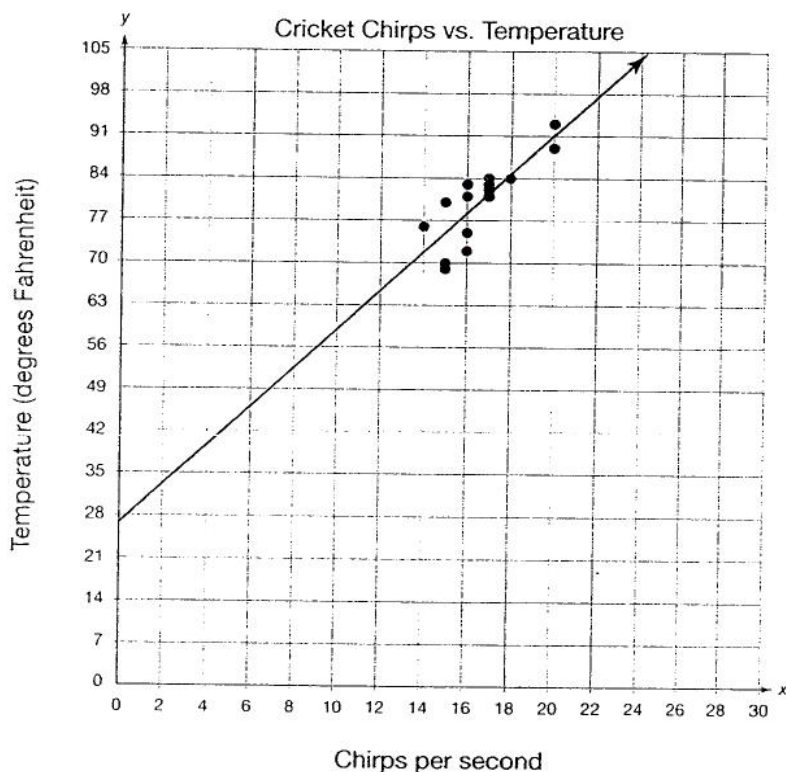


1. Use a ruler to draw the line that best fits the data in the graph.
2. What does the y -intercept of your line mean in terms of the context of the problem?
 Use a complete sentence in your answer.

3. If a line of best fit models the data very well, what would you expect to see in a graph of the data and the line?
 - a. The line has a positive slope.
 - b. The line has a negative slope.
 - c. The line is very close to all of the points.
 - d. The line is close to some of the points but not very close to other points.

4. You use a graphing calculator to find a linear regression equation for some data. The calculator also produces a correlation coefficient of 0.9700513659. Use a complete sentence to explain what this value means.

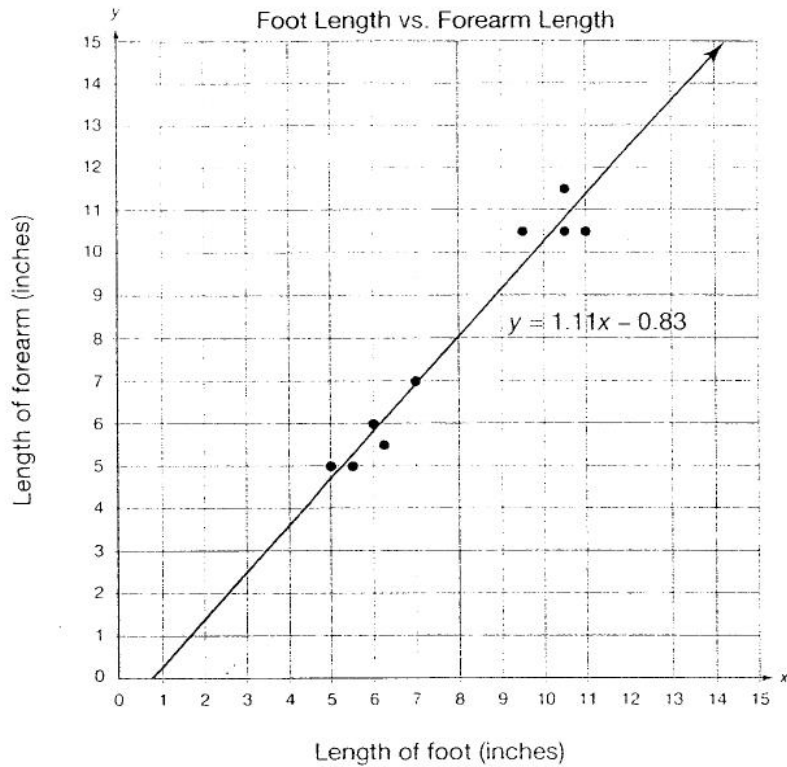
Use the graph below to answer Questions 5 and 6.



5. Write the equation of the best fit line shown in the graph above. Show all your work. Be sure to define your variables and include units. Mark and label any points on the graph that you use to find your answer.

6. What does the slope of your line mean in the context of your problem? Use a complete sentence in your answer.

Use the graph and best fit line given below to answer Questions 7 through 9.



7. Use the equation of the best fit line to predict the length of a person's forearm if the length of their foot is 8 inches. Show all your work.

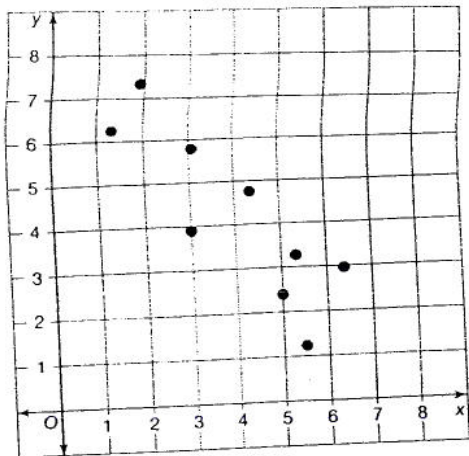
8. Use the equation of the best fit line to predict the foot length of a person with a forearm length of 12.25 inches. Show all your work and round your answer to the nearest hundredth.

9. What does the slope of your line mean in the context of your problem? Use a complete sentence in your answer.

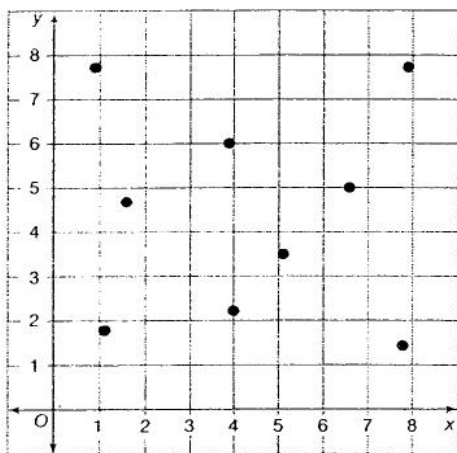
10. You enter data into a graphing calculator to find the linear regression equation. In addition to producing the equation, the calculator produces a correlation coefficient. Which of the following correlation coefficients would indicate that the data are NOT very close to forming a straight line?
 - a. -0.8979
 - b. 0.08979
 - c. 0.8979
 - d. 0.9785

For Questions 11 through 13, determine whether the points in each scatter plot have a positive correlation, negative correlation, or no correlation.

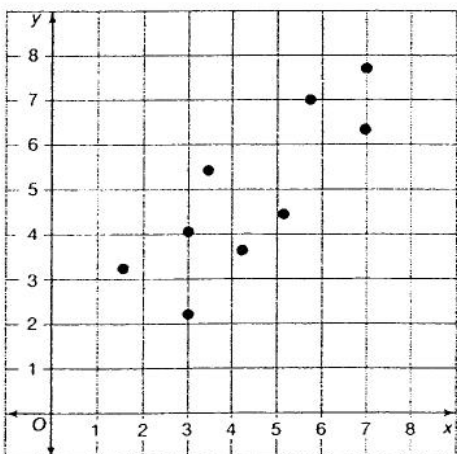
11.



12.



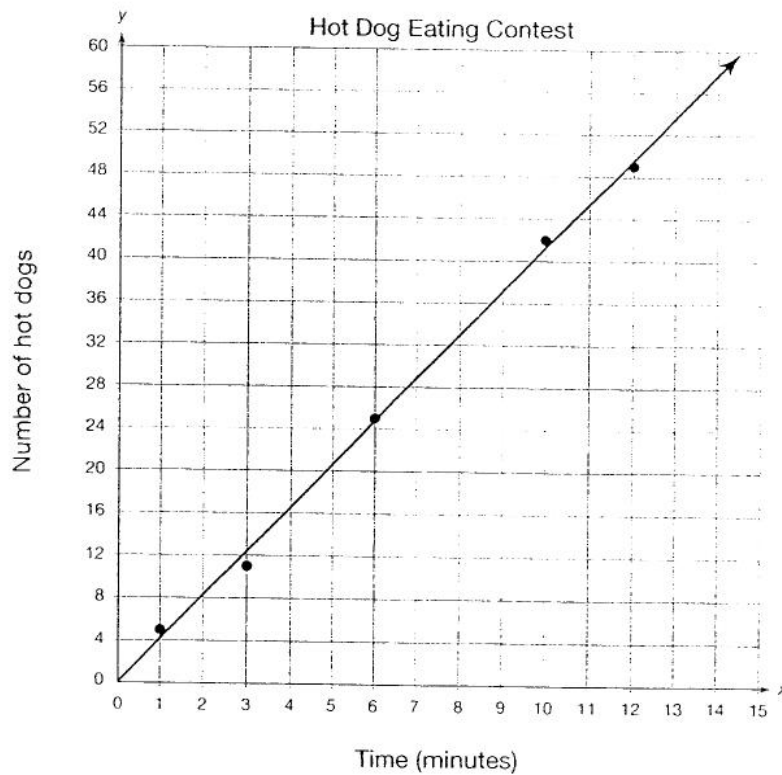
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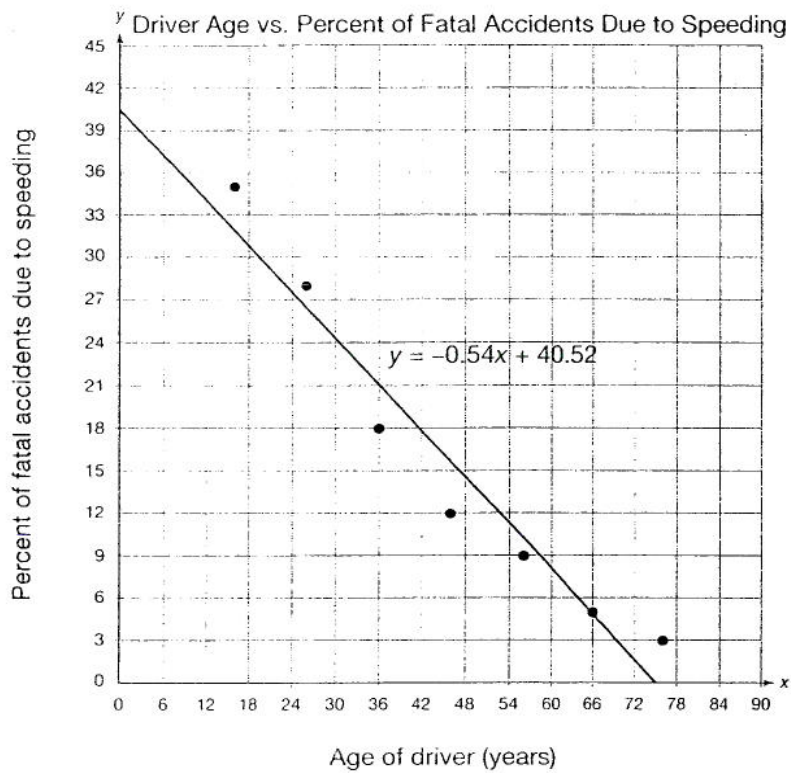
14. Use a graphing calculator to write a linear regression equation for the data in the table below.

The data in the table show the relationship between the number of minutes a basketball player plays in a game and the number of points he scores.

Time	Points
minutes	points
2	3
5	4
8	6
12	9
18	13
22	15
25	16
30	20
32	21
35	24

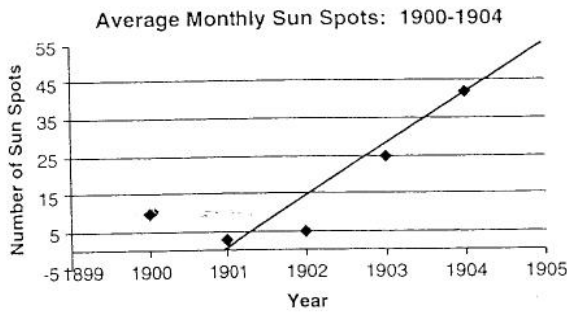


15. Write the equation of the best fit line shown in the graph above. Show all your work. Be sure to define your variables and include units. Mark and label any points on the graph that you use to find your answer.



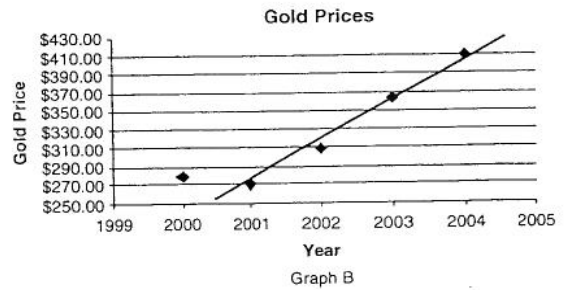
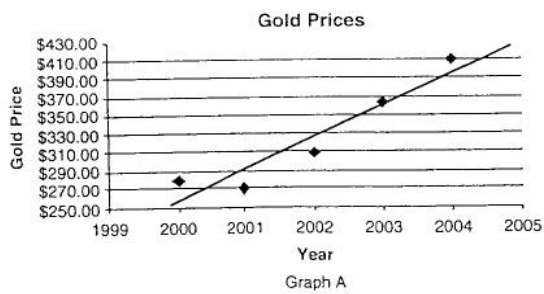
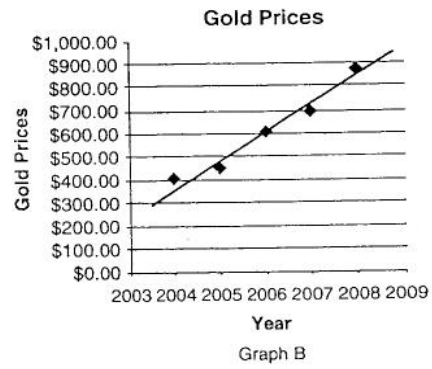
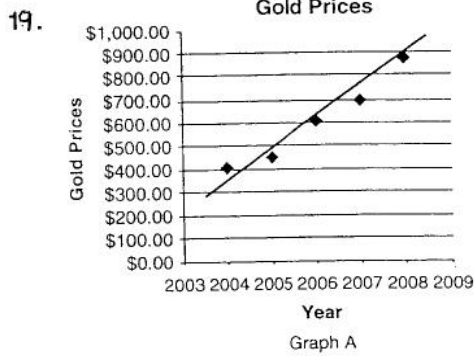
16. Describe the correlation of the data displayed in the graph.
17. Use the equation of the best fit line to predict the number of fatal accidents due to speeding if the age of the driver is 84. Is your answer reasonable in the context of the problem? Why or why not? Show all your work and use a complete sentence in your answer.

18. Predict the average monthly sun spots that occurred in 1905.



Source: National Geophysical Data Center

Compare each pair of graphs. Which line models the data better? Explain your reasoning.



Use a graphing calculator to find the equation of the line of best fit.

20.

Mean Temperatures in Phoenix, Arizona	
Month	Temperature (°F)
Jan (1)	54.2
Feb (2)	58.2
Mar (3)	62.7
Apr (4)	70.2
May (5)	79.1
Jun (6)	88.6
Jul (7)	92.8

$$y = \underline{\hspace{10em}}$$

$$r = \underline{\hspace{10em}}$$

21.

Average Number of Books Read by Students	
Age of Student (years)	Number of Books Read
6	3
8	12
10	35
12	60
14	71
16	80
18	87

$$y = \underline{\hspace{10em}}$$

$$r = \underline{\hspace{10em}}$$

22.

Average Number of Movies Watched by Students	
Age of Student (years)	Number of Movies Watched
2	3
4	5
6	10
8	22
10	30
12	38
14	50
16	75

$$y = \underline{\hspace{10em}}$$

$$r = \underline{\hspace{10em}}$$