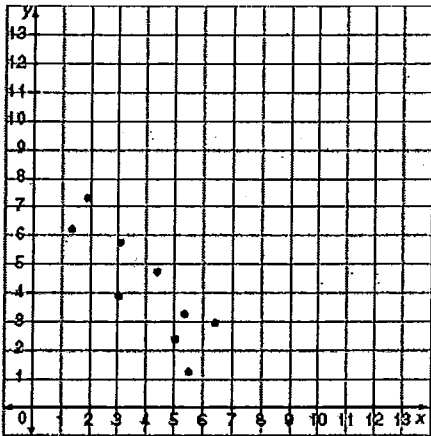


If you
~~X~~ have a
 answer close to
 mine you are right!

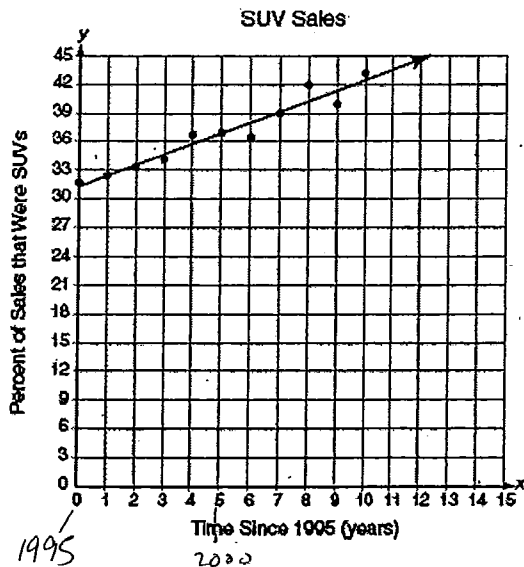
- Suppose that you use a graphing calculator to determine a linear regression equation for some data. The calculator produces a correlation coefficient of 0.9700513659. Explain what this number tells you about the data. *The data almost forms a straight line.*
- Determine whether the points in the scatter plot have a positive correlation, a negative correlation, or no correlation. Then determine which of the values of r you think is most accurate. Explain why you chose your answer.



- $r = 0.8$
- $r = -0.8$
- $r = 0.08$
- $r = -0.08$

Negative correlation
 - .8 because it is
 close to being a
 straight line and
 -.8 is closer to -1.

- The Fast Car dealership tracks its automobile sales based on the type of automobile. The graph shows the percent of sales that were SUVs for the years from 1995 to 2005.

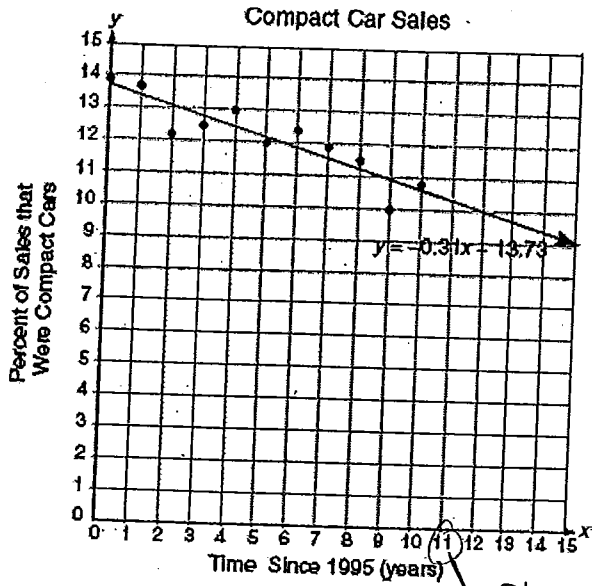


$(0, 31.5) (1, 32.5)$
 $m = \frac{32.5 - 31.5}{1 - 0} = \frac{1}{1} = 1$
 $b = 31.5$

- Explain what year is represented by 7 on the graph. *2002*
- Write the equation of the line of best fit in the graph. Define your variables and include the units.
 $y = 1x + 31.5$
- What does the slope of the line represent in this problem situation?

1% of sales were SUV's per year

4. The Fast Car dealership tracks its automobile sales based on the type of automobile. The graph shows the percent of sales that were compact cars for the years from 1995 to 2005.



- a. Use the equation provided to predict the percent of sales that were compact cars in the year 2006.
 $y = -.31(11) + 13.73 = 10.32$
- b. Use the equation provided to predict the year in which the percent of sales that were compact cars was 11%.
 $11 = -.31x + 13.73$
 $9 = 8.8 = x$
 $1995 + 9 = 2004$
5. A scientist wonders if you can predict a person's weight at 30 years based on the person's weight at 1 year. She uses some medical files to collect the following data.

Weight at 1 Year (in pounds)	Weight at 30 Years (in pounds)
21	124
25	128
23	130
24	132
20	125
15	122
25	135
21	130
17	128
24	132

- a. Create a scatter plot from the data table. First, label the axes to represent the independent and dependent variables. Next, choose the appropriate intervals for your scatter plot. Finally, name your scatter plot. **use your own graph paper**

b. Use a ruler to draw the line that best fits the data on your graph in part (a). Then, write the equation of your line. Be sure to define your variables and include the units.

$$y = .88x + 110$$

c. What does the y-intercept of your line mean in terms of the context of the problem?

If 0 pounds at 1 year then at 30 you would be 110.

d. According to your line, approximately how many pounds does a person gain each year from the age of 1 year to the age of 30 years? Explain your reasoning.

.88 lbs = 1 year

e. Use the equation of your line to predict how much someone who weighs 19 pounds at 1 year will weigh at 30 years. Is your answer reasonable in the context of the problem?

$$y = .88(19) + 110 = 126.72 \text{ lbs.}$$

6. You just got your ACT scores. Your composite score wasn't exactly what you had expected. You wonder if you could have predicted your composite score using your GPA. You collect the following data for 10 students from the counseling office.

GPA points	ACT Composite Score points
3.2	18
3.3	21
3.1	22
3.5	25
3.4	27
3.7	29
3.8	28
3.7	28
3.9	29
4.0	29

~~d.~~ Write the ordered pairs from the table that show the ACT composite score as the dependent variable, and the GPA as the independent variable.

(a) ~~b.~~ Create a scatter plot of the ordered pairs on the grid shown. **Use your own graph paper**

~~c.~~ What is an advantage of using a graph with a break in it? To see data better.

? ~~d.~~ What is a disadvantage of using a graph with a break in it?

e. Use a ruler to draw the line of best fit. Then, write the equation of your line. Define your variables.

$$y = 7.87x + -4.41 \text{ OR } y = 7.87x - 4.41$$

f. Use your equation to predict the ACT composite score of a student with a GPA of 2.9. Show all your work.

$$18.4$$

$$7.87(2.9) - 4.41$$

g. Use your equation to predict the GPA of a student with an ACT composite score of 20. Show all your work.

$$20 = 7.87x - 4.41$$

$$3.1$$

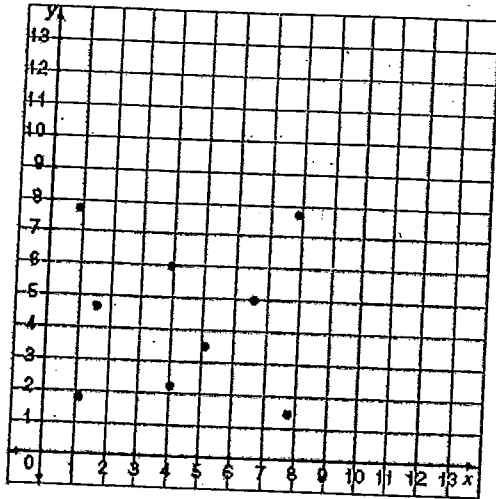
h. Describe the correlation of the data displayed in the graph in part (b). Explain your reasoning.

Positive, bc it trend up + right

i. Suppose that the correlation coefficient of these data is 0.8672. Explain what this number tells you about the data.

It is close to forming a line

7. Determine whether the points in the scatter plot have a positive correlation, a negative correlation, or no correlation. Then determine which of the values of r you think is most accurate. Explain why you chose your answer.



- $r = 1$
- $r = 0.5$
- $r = 0.01$

NO CORRELATION
 0.01 because it is
 farthest away from 1 or -1
 and the data does not
 form a straight line

8. The data in the table show the cost of ordering DVDs from an online company, including the flat shipping fee.

Number of DVDs (n)	Cost in Dollars (C)
3	11
6	17
10	25

What is the equation of the line that best fits the data if the number of DVDs, n , is graphed on the horizontal axis, and the cost, C , is graphed on the vertical axis?

$$y = 2x + 5$$

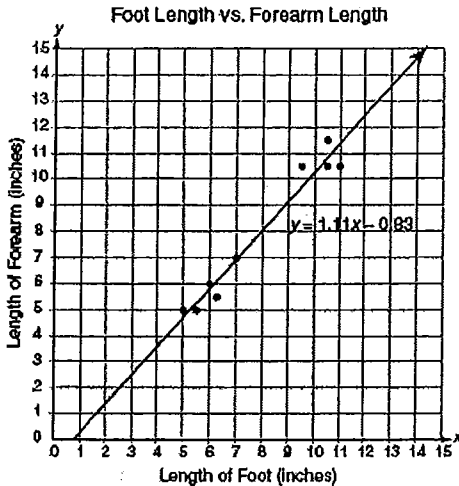
9. A baseball coach would like to be able to predict the number of hits his players will get based on the number of times they are at bat. He graphs some data and determines the line of best fit. The equation of the line of best fit is $y = 0.32x - 20.51$, where x is the number of times at bat and y is the number of hits. How many hits should he expect from a player who is at bat 175 times? Round your answer to the nearest whole number.

$$y = .32(175) - 20.51$$

$$y = 35.49$$

$y = 35 \text{ or } 36$

10. The data on the graph show the foot lengths and forearm lengths for a group of people. The line of best fit for the data is shown. Use the equation of the line of best fit to predict the length of a person's forearm if the length of their foot is 8 inches.



$$y = 1.11(8) - 0.83 = \boxed{8.05}$$

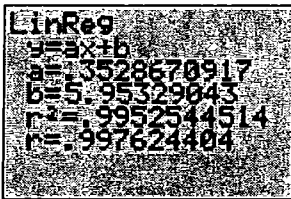
~~$8 = 1.11x - 0.83$~~
 ~~$+0.83$~~
 ~~$8.83 = 1.11x$~~
 ~~1.11~~
 ~~$7.95 = x$~~ ~~$x = 8.05$~~

11. A veterinarian student tracks the weight of a kitten, in ounces, from the age of 0 to 32 weeks. She graphs the data and determines the line of best fit is $y = 4.03x - 3.27$, where x is the number of weeks and y is the number of ounces. How much should she expect a kitten that is 18 weeks old to weigh? Round your answer to the nearest whole number.

$$y = 4.03(18) - 3.27$$

$$y = 69.27$$

12. Suppose you perform a linear regression on a graphing calculator, as shown. What does the value of a represent?



a is the slope.

13. Which of the following is not a possible advantage of using a graph with a break in it?

- a. You can see all the data.
- b. You can see the y -intercept.
- c. You can easily draw a line of best fit.
- d. You can more easily determine the slope of the line.

— you can see the y -intercept clearly either way.

14. Which of the following correlation coefficients would indicate that data are *not* very close to forming a straight line?

- a. -0.8979
- b. 0.08979
- c. 0.8979
- d. 0.9785

← furthest from 1 or -1

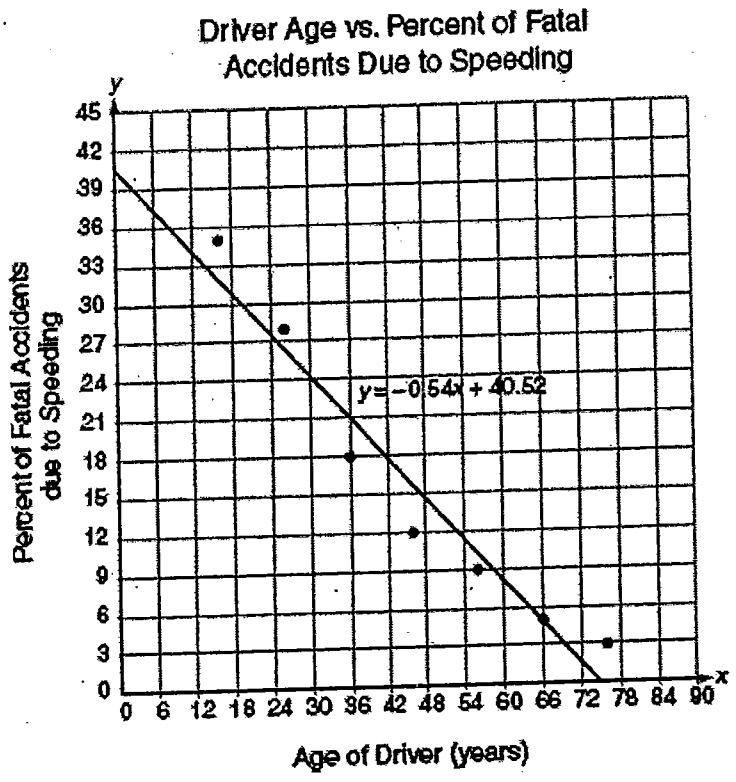
$$54 = 1.12x + 28.78$$

$$-28.78$$

$$\frac{25.22}{1.12} = 1.12x$$

$$x = 22.5$$

15. Joe tracked the height of his Dalmatian puppy from age 13 weeks to 25 weeks. He graphed the data and determined the line of best fit is $y = 1.12x + 28.78$ where x is the age in weeks and y is the height in centimeters. How old was the puppy when he was 54 centimeters tall? Round to the nearest tenth.
16. Suppose that you use a graphing calculator to determine a linear regression equation for some data. The calculator produces a correlation coefficient of 0.0034571826. What does this tell you about the data? *The data has no correlation and does not form a straight line.*
17. The data on the graph show the percents of fatal accidents due to speeding and the ages of the drivers. The line of best fit for the data is shown. Use the equation of the line of best fit to predict the age of drivers with 15% fatal accidents due to speeding. Round your answer to the nearest hundredth.



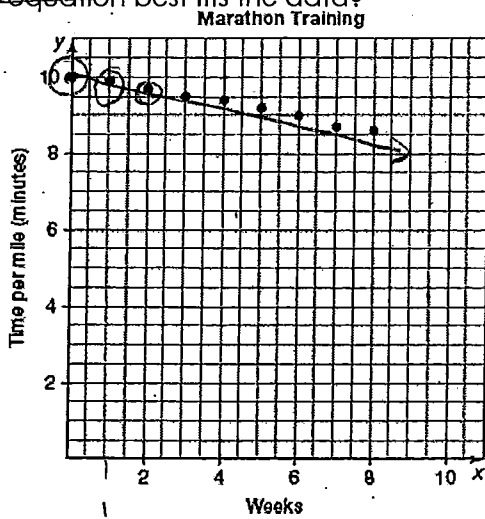
$$15 = -0.54x + 40.52$$

$$-40.52$$

$$-25.52 = -0.54x$$

$$47.26 = x$$

18. Janet is training for a marathon. She decides to track her time per mile, in minutes, for 8 weeks. Which equation best fits the data?



$(0, 10)$ ~~$(1, 9)$~~ $(2, 9.5)$

$$m = \frac{10 - 9.5}{0 - 2} = \frac{0.5}{-2} = -\frac{1}{4}$$

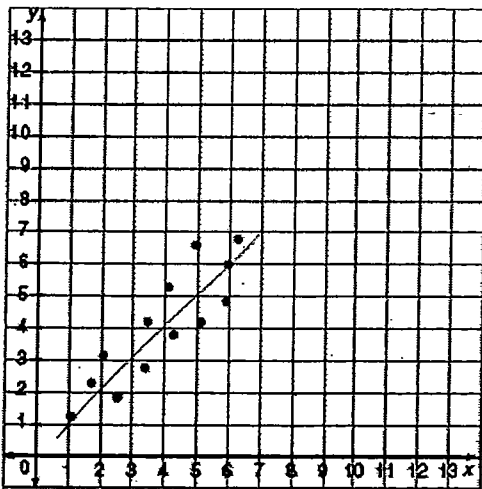
$b = 10$

$y = -\frac{1}{4}x + 10$

19. A medical student is conducting a study to track boys' weight from age 5 to age 18. The student graphs some data and determines the line of best fit is $y = 1.73x + 80.13$. What does the slope mean in this situation?

- a. The increase in the number of pounds a boy gains each year
- b. The decrease in the number of pounds a boy gains each year
- c. The increase in the number of years for each pound a boy gains
- d. The decrease in the number of years for each pound a boy gains

20. Which value of r most accurately describes the correlation in the graph shown?



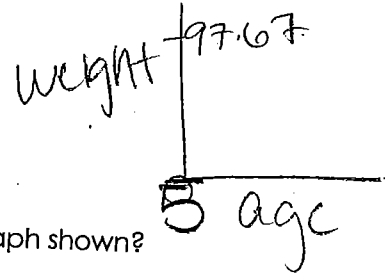
- a. $r = -0.9$
- b. $r = -0.09$
- c. $r = 0.09$
- d. $r = 0.9$

→ must be positive, and it forms a straighter line, so closer to 1

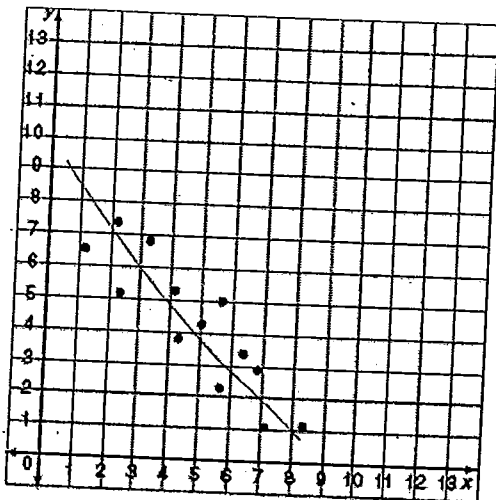
21. Suppose that you use a graphing calculator to determine a linear regression equation for some data. The calculator produces a correlation coefficient of -0.9248637156 . What does this tell you about the data? *It forms almost a straight line and it has a negative correlation.*

22. A medical student is conducting a study to track girls' weight from age 5 to age 18. The student graphs some data and determines the line of best fit is $y = 0.68x + 97.67$. Which of the following best describes what the y-intercept means in this problem situation?

- a. The number of pounds gained for each year
- b. The weight of a girl at age 0
- c. The weight of a girl at age 5 \rightarrow b/c start at age 5
- d. The weight of a girl at age 18



23. Which value of r most accurately describes the correlation in the graph shown?



- a. $r = -0.8$
 - b. $r = -0.08$
 - c. $r = 0.08$
 - d. $r = 0.8$
- \rightarrow negative + needs to be close to -1 .