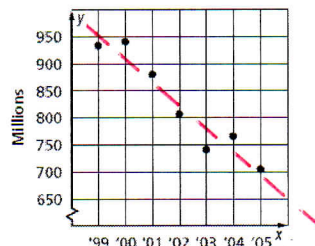


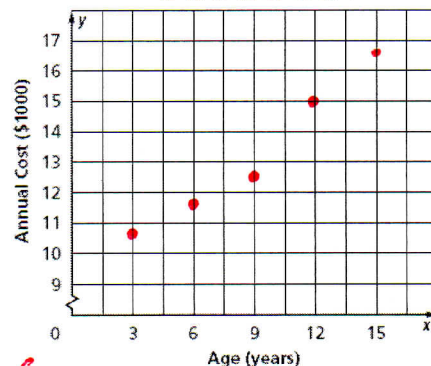
1. **MUSIC** The scatter plot shows the number of CDs (in millions) that were sold from 1999 to 2005. If the trend continued, about how many CDs were sold in 2006?

about 650 million
 (see dashed line)



2. **FAMILY** The table below shows the predicted annual cost for a middle income family to raise a child from birth until adulthood. Draw a scatter plot and describe what relationship exists within the data.

Cost of Raising a Child Born in 2003					
Child's Age	3	6	9	12	15
Annual Cost (\$)	10,700	11,700	12,600	15,000	16,700



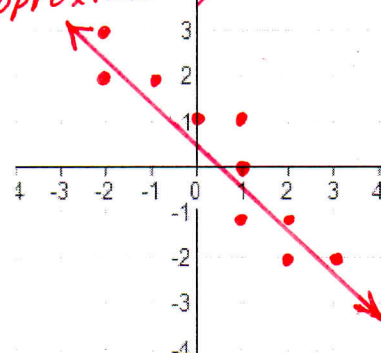
There is a positive association between child's age and the predicted annual cost of raising that child. The association appears to be approximately linear.

3. Make a scatter plot of the data in the table. Draw a line of best fit. What is the equation of the line of best fit?

X	-2	-2	-1	0	1	1	1	2	2	3
Y	2	3	2	1	0	1	-1	-1	-2	-2

$$\hat{y} = .78113... - .96226...x$$

\hat{y} = predicted y-value from LinReg operation
 a = y-intercept $\approx .781$
 b = slope $\approx -.962$



4. **EDUCATION** The table at the right gives the number of hours spent studying for a science exam and the final exam grade.

Study Hours	3	2	5	1	0	4	3
Grade	84	77	92	70	60	90	75

- a. Draw a scatter plot of the data and draw in the line of best fit.

- b. What is the equation for the line of best fit?

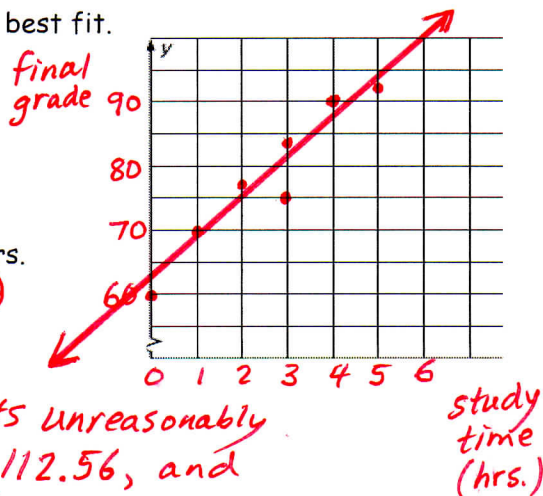
$$\hat{y} = 62.048... + 6.3145...x$$

- c. Predict the grade for a student who studied for 6 hours.

$$\hat{y}(6) = 62.048... + 6.3145...(6) \approx 99.935$$

- d. Could this line go on forever? Why or why not?

No, since for studying that lasted more than 6 hours, the model predicts unreasonably high grades. For example, $\hat{y}(8) \approx 112.56$, and most exams have a top score of only 100 or so.



*slope = change in y when x changes by +1 unit
= 1.15 by inspection*

5. **BASEBALL** The scatter plot shows the average price of a major-league baseball ticket from 1997 to 2006.

- a. Use the points (2001, 17.60) and (2002, 18.75) to write the slope-intercept form of equation for the line of fit shown in the scatter plot.

*Let $\hat{y} = mx + b$. When $\hat{y} = 17.60$, $x = 2001$, $m = 1.15$.
Thus $17.60 = 1.15(2001) + b$
 $17.60 - 1.15(2001) = b$
 $-2283.55 = b$*

Note: Here we are using b to represent intercept, not slope.

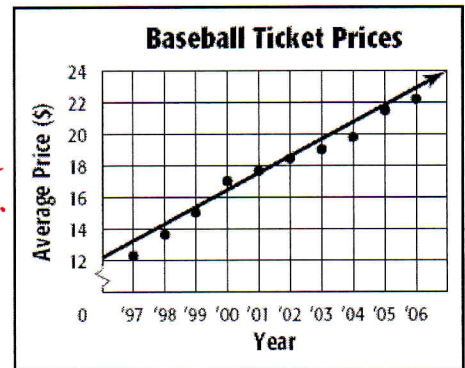
Equation:

$\hat{y} = -2283.55 + 1.15x$

- b. Use your equation to tell the price of a ticket in 2009. Is this extrapolation or interpolation?

$\hat{y}(2009) = -2283.55 + 1.15(2009) = \26.80

extrapolation



Source: Team Marketing Report, Chicago

6. **DISEASE** The table shows the number of cases of Foodborne Botulism in the United States for the years 2001 to 2005.

- a. Draw a scatter plot and determine, what relationship, if any, exists in the data.

There is a negative, approximately linear relationship between year and # of U.S. foodborne botulism cases.

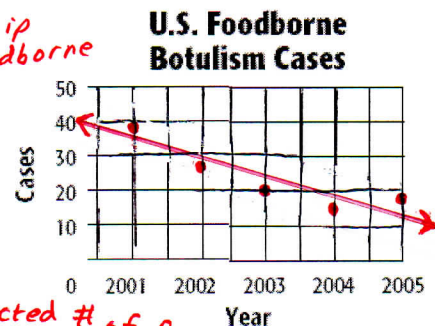
- b. Draw a line of fit for the scatter plot, and write the slope-intercept form of an equation for the line of fit.

$\hat{y} = 10840.4 - 5.4x$

where x = year (YYYY format), \hat{y} = predicted # of foodborne botulism cases in U.S.

Note: Using YY format for year, equation would be $\hat{y} = 40.4 - 5.4x$.

U.S. Foodborne Botulism Cases					
Year	2001	2002	2003	2004	2005
Cases	39	28	20	16	18



7. **ZOOS** The table shows the average and maximum longevity of various animals in captivity.

- a. Draw a scatter plot and determine, what relationship, if any, exists in the data.

There is a positive and roughly linear relationship between average longevity and maximum longevity for the types of animals studied.

- b. Draw a line of fit for the scatter plot, and write the slope-intercept form of an equation for the line of fit.

$\hat{y} = 22.44578... + 1.2216...x$

- c. Predict the maximum longevity for an animal with an average longevity of 33 years. Is this an example of Extrapolation or Interpolation?

*$\hat{y}(33) \approx 22.44578 + 1.2216(33)$
 ≈ 62.76 years*

interpolation

Longevity (years)							
Avg.	12	25	15	8	35	40	41
Max.	47	50	40	20	70	77	61

