

Example

The table below shows the number of students per computer in United States public schools for certain school years from 1990 to 2000.

Year	1990	1992	1994	1996	1998	2000
Students per Computer	22	18	14	10	6.1	5.4

A. What is the equation for the line of best fit?

$$y = -1.75x + 21.35$$

B. What is the meaning of the slope?

The number of students per computer decreases by 1.75 per year.

C. What is the meaning of the y-intercept?

In 1990, the number of students per computer was predicted to be 21.35.

The equation $y = 37x - 153$ models the relationship where x is the number of carbon atoms, and y is the boiling point.

- a. What is the boiling point for a hydrocarbon with a 10 carbon Atoms?

$$y = 37(10) - 153 = 217^{\circ}$$

- b. If the boiling point is 587 how many carbon atoms are there?

$$\begin{array}{r} 587 = 37x - 153 \\ +153 \qquad \qquad +153 \\ \hline 740 = 37x \\ \frac{740}{37} = \frac{37x}{37} \qquad 20 = x \end{array}$$

Five students in Mrs. Straub's Algebra class reported the number of hours that they studied for a test. The number of hours and their test scores are in the table below.

Hours of Study	Test Score
2	85
3	81
4	88
5	91
6	98

a. Find the equation of the line of best fit

$$y = 3.6x + 74.2$$

b. What is the meaning of the y-intercept?

A student who studied 0 hours is predicted to earn a 74.2.

c. What is the predicted score of a student who studied 1.5 hours?

$$y = 3.6(1.5) + 74.2 = 79.6$$

d. If a student earned a 77 on the test, based on the line of best fit, how many hours did they study?

$$\begin{array}{r} 77 = 3.6x + 74.2 \\ -74.2 \quad -74.2 \\ \hline 2.8 = 3.6x \end{array}$$

$$\frac{2.8}{3.6} = \frac{3.6x}{3.6}$$

$$0.78 = x$$

0.78 hours = x

5. The table shows the average hourly earnings in the US production workers for selected years.

	0	5	10	15	20	25	30	35	39
Year	1960	1965	1970	1975	1980	1985	1990	1995	1999
Earnings	2.09	2.46	3.23	4.53	6.66	8.57	10.01	11.43	13.24

- a. Find the regression equation (line of best fit): $y = .30x + .92$
- b. What is the slope? $m = .30$
- c. What is the meaning of the slope? **Average hourly earnings increase by \$0.30 per**
- d. What is the y-intercept? $.92$
- e. What is the meaning of the y-intercept? **In 1960, the earnings were predicted to be \$0.92.**
- f. According to the regression equation what will be the average hourly earnings in the year 2010? $\$15.92$

g. Identify the correlation coefficient. $r = 0.99$

h. Describe the correlation. **strong pos.**

$$\begin{array}{r} 2010 \\ -1960 \\ \hline 50 \end{array}$$

$$y = .30(50) + .92$$