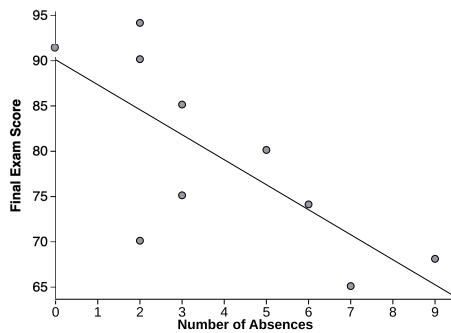


1. A random sample of 45 books is selected from the library. The number of pages and the weight of each book is recorded. The relationship between the number of pages in the book, x , and the weight of the book (in ounces), y , is modeled by the equation $\hat{y} = 2 + 0.035x$.
 - a. What is the predicted weight for a book with 425 pages?
 - b. Identify and interpret the slope.
 - c. Identify and interpret the y -intercept.

2. At the end of a semester, a math teacher wonders if a student's attendance has an impact on final exam scores. Here is a scatterplot that shows the number of days absent and final exam score for a random sample of 10 students. A regression line is also shown.



- What is the approximate y -intercept of the regression line? Interpret this value.
 - The slope of the regression line shown is -2.75 . Interpret this value.
 - Use the regression line to predict the final exam score for a student with 4 absences.
 - The student with 5 absences scored an 80 on the final exam. Did the student score better or worse than the score that would be predicted using the regression line? Explain.
3. The relationship between height (in feet) and weight (in pounds) for a random sample of polar bears is modeled by the equation $\widehat{\text{weight}} = 475(\text{height}) - 3250$. The largest polar bear on record was found in Alaska in 1960. He was 12 feet tall and weighed 2,210 pounds. Calculate and interpret the residual for this polar bear using the given model.

4. Susan is the head of human resources at a small business. To ensure that employees are being paid fairly, she records the number of years experience and the current salaries of the employees at the company. She creates a linear regression model to fit the data. Selected values are shown in the table along with the equation for the regression model.

Years experience	3	7	15	16
Salary (dollars)	47,250	57,500	62,400	65,500

$$\widehat{\text{salary}} = 45,769 + 1,209(\text{years experience})$$

- a. What is the residual for an employee with 7 years of experience?
- b. Use the model to make a prediction for an employee with 10 years of experience.
- c. Use the model to make a prediction for an employee with 30 years of experience.
- d. Which prediction should be trusted more, the prediction for 10 years or for 30 years? Why?
5. As used cars are driven more miles, they tend to lose value. For a random sample of 150 used cars recently sold, the linear regression model $\hat{y} = 22,500 - 0.2x$ relates the car's mileage, x , and its sale price, y . What is the estimated decrease in sale price that corresponds to an increase of 50,000 miles?
- A) \$10,000
- B) \$12,500
- C) \$21,500
- D) \$22,500
- E) \$32,500

6. A linear regression model was built to predict the test scores (out of 100) of students based on the number of hours they studied. The regression equation is given as: $\hat{y} = 30 + 5x$, where $\hat{y}$ represents the predicted score and x represents the number of hours studied. A student who studied for 8 hours achieved an actual score of 75. What is the residual score for this student?
- A) -5
 - B) 5
 - C) 10
 - D) -10