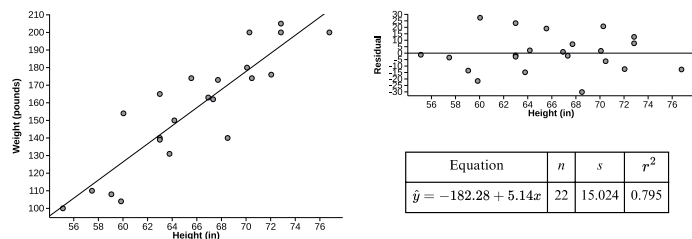
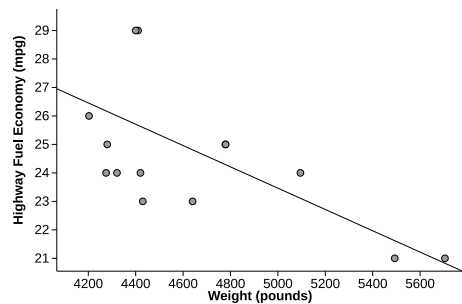


1. The heights and weights of a random sample of 22 individuals are shown in the scatterplot. The least squares regression line describing the relationship between x = height (in inches) and y = weight (in pounds) is given along with the r^2 value and the residual plot.



- a. Is a linear model appropriate for these data? Give several reasons to justify your answer.
- b. Interpret r^2 in the context of the problem.

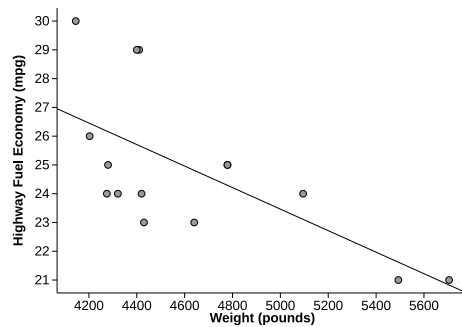
2. The scatterplot shows the vehicle weight (in pounds) and highway fuel economy (in miles per gallon) for a random sample of different truck models. The table shows computer output from a linear regression analysis on the data.



Predictor	Coef	SE Coef	T	P
Constant	-42.167	5.58	7.557	0.000
Weight	-0.004	0.001	-3.115	0.008
S = 2.117		R-Sq=42.7%	R-Sq(adj)=39.4%	

- What is the value of r^2 ? Interpret this value.
- What is the value of the standard deviation of the residuals? Interpret this value.
- What is the value of the standard error of the slope? Interpret this value.

3. The scatterplot shows the vehicle weight (pounds) and highway fuel economy (miles per gallon) for 15 different trucks.



The equation of the least-square regression line is $\hat{y} = 42.167 - 0.004x$, where $\hat{y}$ = predicted highway fuel economy and x = weight.

- The GMC Sierra weighs 4,400 pounds. Predict the highway fuel economy for the GMC Sierra using the regression line.
- The GMC Sierra has an actual highway fuel economy of 29 mpg. Calculate the residual for the GMC Sierra.

4. The monthly cost of electricity for a random sample of 40 homes during a summer month was recorded along with the average temperature of the thermostat setting in the home. It was found that there was a strong, negative, linear relationship between the monthly cost of electricity and the average temperature of the thermostat.

The coefficient of determination for the relationship is 0.862. What is the value of r ?

5. Researchers are interested in how the age of older adults affects their cognitive memory loss. A random sample of adults over the age of 70 years was selected and the adults were given a memory test with a minimum score of 1 and a maximum score of 25. The higher the score, the better the memory. The results are shown in the regression analysis.

Term	Coef	SE Coef	T-Value	P-Value
Constant	29.134	17.779	1.639	0.132
Age	-0.204	0.225	-0.904	0.387
$S = 3.558$		$R-Sq = 7.6\%$		$R-Sq(adj) = 7.8\%$

Which of the following is the most interpretation of the statistic 7.6% in the regression output?

- A) 7.6% of the observed memory test scores are close to the prediction line.
- B) 7.6% of the variation in the memory test score can be explained by the linear relationship with age.
- C) For each increase of one year in age, the regression model predicts a decrease of 0.076 points in the memory test score.
- D) The typical deviation between observed and predicted memory test score is 0.076.