

## Chapter 7

**1. True or false** If false, explain briefly.

- We choose the linear model that passes through the most data points on the scatterplot.
- The residuals are the observed  $y$ -values minus the  $y$ -values predicted by the linear model.
- Least squares means that the square of the largest residual is as small as it could possibly be.

**43. Cigarettes** Is the nicotine content of a cigarette related to the “tar”? Using the collection of data (in milligrams) of 29 cigarettes, use **Minitab Express** to produce the scatterplot, residuals plot, and regression analysis.

- Do you think a linear model is appropriate here? Explain.
- Explain the meaning of  $R^2$  in this context.

**45. Another cigarette** Consider again the regression of *Nicotine* content on *Tar* (both in milligrams) for the cigarettes examined in Exercise 43.

- What is the correlation between *Tar* and *Nicotine*?

**47. Last cigarette** Take another look at the regression analysis of tar and nicotine content of the cigarettes in Exercise 43.

- Write the equation of the regression line.
- Estimate the *Nicotine* content of cigarettes with 4 milligrams of *Tar*.
- Interpret the meaning of the slope of the regression line in this context.
- What does the  $y$ -intercept mean?
- If a new brand of cigarette contains 7 milligrams of tar and a nicotine level whose residual is  $-0.5$  mg, what is the nicotine content?