Chapter 12: More about Regression

Key Vocabulary:

- sample regression line
- true regression line
- t interval for slope
- standard error of slope
- t test for slope
- standardized test statistic
- standard error
- exponential model
- power model
- logarithmic model

12.1 Inference for Linear Regression (pp.739-757)

1. What is the difference between a *sample regression line* and *population (true) regression line*?

2. Explain the *sampling distribution* of *b*?

3. Give the equation for the *true regression line*, and state what each component of the equation represents.

4. Summarize the *conditions* for regression inference:

- L
- I
- N
- E
- R

5. Explain how to *check the conditions* for regression inference:

- L
- I
- N
- E
- R

6. Record the formula for the *standard error of the slope*? Define the variables.

7. What is the formula for the *t-interval of the slope* of a least-squares regression line? Is this on the AP exam formula sheet?

8. What is the formula for the *t-test for the slope* of the population regression line? Is this on the AP exam formula sheet?

9. Describe the distribution of the *standardized test statistic* $\frac{b-\beta}{\text{SE}_b}$.

10. What is the formula for constructing a *confidence interval for a slope*?

11. What calculator commands are used to get the value of t^*?

12. Can you use your calculator to conduct a test and confidence interval for the slope?

12.2 Transforming to Achieve Linearity (pp.765-783)

1. What does it mean to *transform data*?

2. What is a *power model*?

3. Give three *example*s of power models?

4. Aside from power transformations, how can you *linearize an association* that follows a power model in the form $y = ax^p$?

5. Describe a *logarithmic model*. Give two examples.

6. Describe an *exponential model*. Give two examples.

7. Describe the two methods used to linearize a relationship that follows an exponential model.

8. Show how to use logarithms to transform the data given by $y = ax^p$ to produce a linear relationship.

9. The big idea using logarithms to transform data is that "if a variable grows _____, its _____ grow linearly."

10. Describe how to *achieve linearity* from a power model as explained on page 777.

11. After using a logarithm transformation, what does the *scatter plot* of the data show?