Chapter 11: Inference for Distributions of Categorical Data

Key Vocabulary:

- one way table
- chi-square test for goodness of fit
- chi-square statistic
- expected count
- observed count
- chi square distribution
- degrees of freedom
- chi-square distribution
- components of chi-square
- cell counts
- r x c table
- chi square test for homogeneity
- chi square test for association/ independence

11.1 Chi-Square Goodness of Fit Test (pp.678-690)

1. What is a *one-way table*?

2. What is a *chi-square goodness-of-fit test*?

3. What is the difference between the notation X^2 and χ^2?

4. State the general form for the *null hypotheses* for a χ^2 goodness of fit test.

5. State the general form for the *alternative hypotheses* for a χ^2 goodness of fit test.

6. How do you calculate the *expected counts* for a chi-square goodness-of-fit test? How should you round the answer for the expected counts?

7. What is the shape of a *chi-square distribution*? What happens to the shape as the degrees of freedom increases? (Illustrate with a diagram)

8. Describe the *center and spread* of the chi-square distributions.

9. What is the *chi-square test statistic*? Is it on the formula sheet? What does it measure?

10. How many degrees of freedom does the *chi-square distribution* have?

11. What is the *rule of thumb* for all expected counts in a chi-square goodness of fit test?

12. What conditions must be met in order to use the *goodness of fit test*?

12. How do you calculate *p*-values using chi-square distributions?

14. Can you use your calculator to conduct a chi-square goodness-of-fit test? If yes, what are the calculator commands?

15.What is meant by a *component* of chi-square?

16. What does the *largest component* of chi-square signify?

17.Why is it necessary to perform *follow-up analysis* to a chi-square test?

14.2 Inference for Relationships (pp.696-721)

1. What is the *hypothesis* for a test of homogeneity?

2. Describe the complications with *multiple comparisons*? How are they overcome?

3. Explain how to calculate the expected counts for a test that compares the distribution of a categorical variable in multiple groups or populations.

4. Write the *formula* for the Chi-square test statistic? Is this on the AP Exam formula sheet?

5. What does the Chi-square *test statistic measure*?

6. What information is contained in a *two-way table* for a Chi-square test?

7. How many *degrees of freedom* does a chi-square test for a two-way table with *r* rows and *c* columns have?

8. What *requirements* must be checked before carrying out a Chi-square test for Homogeneity?

9. State the null and alternative hypothesis for the Chi-square test for Homogeneity?

10. Can you use your calculators to do a Chi-square test of homogeneity? If yes, what are the calculator commands?

11. Summarize how to carry out a *Chi-square Test for Homogeneity of Populations*:

12. Explain how and when to conduct a *follow-up analysis* for a test of homogeneity?

13. What does it mean if two variables have an *association*?

14. What does it mean if two variables are *independent*?

15. State the *null and alternative hypotheses* for a Chi-square test for Association/Independence.

16. How is a test of association/independence *different* than a test of homogeneity?

17. How do you calculate *expected counts* for a test of association/independence?

18. Summarize how to carry out a Chi-square Test for Association/Independence:

19. What are the *conditions* for a test of association/independence?

20. When should you use a *chi-square test* and when should you use a *two-sample z test*?