Chapter 11
DISCUSSION 4

Use the following information for answering questions 1 to 8:

The director of transportation of a large company is interested in the usage of her van pool. She considers her routes to be divided into local and non-local. She is particularly interested in learning if there is a difference in the proportion of males and females who use the local routes. She takes a sample of a day's riders and finds the following:

	Male	Female	Total
Local	27	44	71
Non-Local	33	25	58
Total	60	69	129

She will use this information to perform a chi-square hypothesis test using a level of significance of 0.05.

1. The test will involve _____ degree(s) of freedom.

2. The overall or mean proportion of local riders is _____.

3. The expected cell frequency in the Male/Local cell is _____.

4. The expected cell frequency in the Female/Non-Local cell is _____.

5. The critical value of the test is _____.

6. The value of the test statistic is _____.

7. The decision is to reject the _____.

8. The decision made suggests that there is a difference between the proportion of males and females who ride local versus non-local routes.

Use the following information for answering questions 9 to 14:

One criterion used to evaluate employees in the assembly section of a large factory is the number of defective pieces per 1,000 parts produced. The quality control department wants to find out whether there is a relationship between years of experience and defect rate. A defect rate is calculated for each worker in a yearly evaluation. The results for 100 workers are given in the table below:

		Years Since Training Period		
		< 1 Year	1 – 4 Years	5 – 9 Years
Defect Rate:	High	6	9	9
	Average	9	19	23
	Low	7	8	10

9. Which test would be used to properly analyze the data in this experiment to determine whether there is a relationship between defect rate and years of experience?

a) χ^2 test for independence
b) χ^2 test for differences between two proportions
c) χ^2 test for differences among more than two proportions
d) none of the above

10. What is the degrees of freedom?

a) 2
b) 3
c) 4
d) 1

11. Find the rejection region necessary for testing at the 0.05 level of significance whether there is a relationship between defect rate and years of experience.

a) Reject H_0 if $\chi^2 > 16.919$
b) Reject H_0 if $\chi^2 > 15.507$
c) Reject H_0 if $\chi^2 > 11.143$
d) Reject H_0 if $\chi^2 > 9.488$

12. What is the expected number of employees with less than 1 year of training time and a high defect rate?

a) 4.17
b) 4.60
c) 5.28
d) 9.17

13. What is the expected number of employees with 1 to 4 years of training time and a high defect rate?

a) 12.00
b) 8.64
c) 6.67
d) 6.00

14. A test was conducted to determine if a relationship exists between defect rate and years of experience. Which of the following *p*-values would indicate that defect rate and years of experience are dependent? Assume you are testing at $\alpha = 0.05$.

a) 0.045
b) 0.055
c) 0.074
d) 0.080