

HW 12 is due on Friday, Nov. 15. Turn in early if you know you will miss class. Exam 3 is Wednesday, Nov. 20. The Final is Tuesday, Dec. 10 from TBA. Quiz 10 is on Wed. Nov. 13 and covers ch. 17–20: especially the one and two sample intervals and tests for proportions. You should be able to do a forwards calculation for \hat{p} and find the sample size needed to estimate p to within a margin of error m . Two sheets of notes. **Two pages: problems A)- D)**

Chi-square test: Expected counts are printed below observed counts.

	< 2	2 to 12	> 12	Total
A,B,C	11	68	3	82
	13.78	62.71	5.51	
D or F	9	23	5	37
	6.22	28.29	2.49	
Total	20	91	8	119

$$\text{Chi-sq} = 0.561 + 0.447 + 1.145 + 1.244 + 0.991 + 2.538 = 6.926$$

$$\text{DF} = 2, \text{ P-Value} = 0.031$$

A) Use the above output to perform a 4 step test of hypothesis for whether there is a relationship between extracurricular activities and grades.

comment: See examples 22.4 and 22.6, p. 570-572, and class notes.

B) A questionnaire sent to the senior class of the University of Illinois College of business administration asked which major within the business program the student had

chosen. The data is in the following table.

	Female	Male
Accounting	68	56
Administration	91	40
Economics	5	6
Finance	61	59

i) Make a table of observed counts, expected counts, and cell chisquare contributions, as done in class. Keep at least 3 decimal places.

ii) Perform a 4 step test of hypothesis for whether there is a relationship between major and gender.

comment: X^2 should be close to 10.827 but a bit off due to rounding. See p. 566, p. 568, ex 22.2, ex 22.3, and ex. 22.7 on p. 578.

C) A study of customers' attitudes toward secondhand stores interviewed samples of shoppers at two secondhand stores of the same chain in two cities. The data is in the

	Income	City 1	City 2
following table.	Under \$10000	70	62
	\$10000 to \$19999	52	63
	\$20000 to \$24999	69	50
	\$25000 to \$34999	22	19
	\$35000 or more	28	24

Perform a 4 step test of hypothesis for whether there is a relationship between city and income if $X^2 = 3.955$.

comment: Note that the test statistic is given. See ex. 22.2, 22.3, 22.5, 22.6 and 22.7.

D) Minitab problem. Double click on the "Shortcut to math programs icon." After a window opens, double click on the icon marked "Student Minitab." After Minitab opens move the cursor to "File" in the NW corner. Drag down "Open Worksheet." (Double click on the icon "Student.") A window will appear. Double click on "Stores.mtw." Click on "OK." Move the cursor to the menu. Drag down "Stat>Tables > Chi-square test." A window will appear. Enter columns C2 - C6 in the "Columns containing the table" box. Click on "OK". You should get a 4 by 5 table with totals, the Chi-sq statistic = X^2 and pvalue. The table headers should be Under25K, 25kTo35K, 35KTo50K, 50KTo75K, 75K&Over, and Total.

Click on the session (top) window. To get your output, drag "File>Print Session Window". Click "OK".

The table shows the number of individuals who last bought jeans from 4 major stores, classified by the individuals' yearly income. Use the Minitab output to determine if there is a relationship between income and the stores. Use a 4 step test.