MTH 324, Quiz #10, Fall 2022 Name KEY

Instructions: Answer each question as thoroughly as possible. Round answers to 4 decimal places as needed. Exact answers are best when possible. Be sure to answer all parts of each question.

1. Employers want to know which days of the week employees are absent in a five-day work week. Most employers would like to believe that employees are absent equally during the week. Suppose a random sample of 60 managers were asked on which day of the week they had the highest number of employee absences. The results were distributed as in the table. For the population of employees, do the days for the highest number of absences occur with equal frequencies during a five-day work week? Test at a 5% significance level.

	Monday	Tuesday	Wednesday	Thursday	Friday
Number of Absences	15	12	9	9	15
expected	12	12	12	12	12

$\chi^2 = \frac{(15-12)^2}{12} + \frac{(12-12)^2}{12} + \frac{(9-12)^2}{12} + \frac{(9-12)^2}{12} + \frac{(15-12)^2}{12} = 3$

p-value = 0.5578

fail to reject null

not strong evidence to think absences are non-random

$H_0: p_i = p_j$ uniform

H_a: not uniform

2. Using the data in the table below, conduct a test of independence to see if gender and living arrangements in college are independent or not. Clearly state your hypotheses and conclusion.

	Dormitory	Apartment	With Parents	Other
Males	72	84	49	45
Females	91	86	88	35

$\chi^2 = 10.12869...$

p-value: $0.0175... < 0.05$

reject null.

residence type at college does appear to depend on gender.

H_0: residence type independent of gender

H_a: residence type not independent of gender.

3. Explain when you should use a Fisher Exact test rather than a standard χ^2 test.

when counts are small and at least 20% of entries in table are 5 or smaller