MTH 324, Quiz #10, Fall 2023 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. Randomly selected records of 140 convicted criminals reveal that their crimes were committed on the days of the week listed in the table below. Test the hypothesis that all the days of the week were equally likely to have a crime committed. Test at a 1% significance level.

Days When Crimes Were Committed								
	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Total
f_o	17	21	22	18	23	24	15	140
	20	20	20	20	20	20	20	

H_0: dist. is uniform
H_a: dist. is not uniform
$\chi^2 = 3.4$
$p = 0.757\ldots$
fail to reject null

no evidence to think day of week have diff rates of crimes

2. Using the data in the table below, conduct a test of independence to see if snack preference and game preference are independent or not. Clearly state your hypotheses and conclusion.

	Pizza Rolls	Chips and Dip	Cookies	**Totals**
Poker	10	3	12	**25**
Trivial Pursuit	8	14	7	**29**
Monopoly	14	17	7	**38**
Wii Bowling	12	7	4	**23**
Totals	**44**	**41**	**30**	**115**

H_0: Independent
H_a: dependent
$\chi^2 = 14.5$
$p = 0.0244\ldots$
reject null

the variable are dependent

3. Explain when you should use a Fisher Exact test rather than a standard χ^2 test. What conditions have to be met?

when the sample size is small,
entry values are sparse
values in table < 5 everywhere