Review Exercises

1. Auto Fatalities The table below lists auto fatalities by day of the week for a recent year (based on data from the Federal Highway Administration). Minitab results are also shown. Use a 0.01 significance level to test the claim that auto fatalities occur on the different days of the week with the same frequency. Can you provide an explanation for the results?

Day	Mon	Tues	Wed	Thurs	Fri	Sat	Sun
Frequency	3797	3615	3724	4004	4867	5786	5004

MINITAB

N	DF	Chi-Sq	P-Value
30797	6	931.347	0.000

2. Measuring Weights When certain quantities are measured, the last digits tend to be uniformly distributed, but if they are estimated or reported, the last digits tend to have disproportionately more 0s or 5s. If we use the last digits (decimal portion) of the 80 weights in Data Set 1 from Appendix B, we get the frequency counts in the table below. Use a 0.05 significance level to test the claim that the last digits of $0, 1, 2, \ldots, 9$ occur with the same frequency. Does it appear that the weights were obtained through measurements?
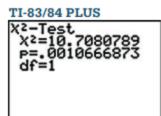
Last Digit	0	1	2	3	4	5	6	7	8	9
Frequency	6	7	4	11	10	8	5	9	10	10

3. Weather-Related Deaths Listed below are the numbers of weather-related deaths in a recent year (based on data from the National Weather Service). Use a 0.01 significance level to test the claim that weather-related deaths occur in the different months with the same frequency. Can you provide an explanation for the result?

Month	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Number of Deaths	39	17	20	19	60	79	109	73	28	5	5	35

4. Bicycle Helmets A study was conducted of 531 persons injured in bicycle crashes, and randomly selected sample results are summarized in the accompanying table (based on results from "A Case-Control Study of the Effectiveness of Bicycle Safety Helmets in Preventing Facial Injury," by Thompson et al., *American Journal of Public Health*, Vol. 80, No. 12). The TI-83/84 Plus calculator results also are shown. At the 0.05 significance level, test the claim that wearing a helmet has no effect on whether facial injuries are received. Based on these results, does a helmet seem to be effective in helping to prevent facial injuries in a crash?

	Helmet Worn	No Helmet
Facial Injuries Received	30	182
All Injuries Nonfacial	83	236

TI-83/84 PLUS

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X²-Test
 X²=10.7080789
 P=.0010666873
 df=1
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5. Flipping and Spinning Pennies Use the data in the table below with a 0.05 significance level to test the claim that when flipping or spinning a penny, the outcome is independent of whether the penny was flipped or spun. (The data are from experimental results given in *Chance News*.) Does the conclusion change if the significance level is changed to 0.01?

	Heads	Tails
Flipping	2048	1992
Spinning	953	1047