Name: _____   **TA:** _____

Here are the actual data from our family over five weeks, indicating how often each kid was selected to set the dinner table.

Days	Eunice	Clarence	Matilda	Horace	Betty	Total
Weekdays	2	7	4	10	2	25
Weekends	1	4	0	2	3	10
Total						35

There are two nominal variables here: Kid (with 5 values) and Day (with two values–weekday and weekend). There are two questions we can ask about these variables.

First, do a multinomial test on how often each kid is selected (i.e., on the Kid variable, ignoring Day).

1. Write a sentence describing the null hypothesis.

2. Fill in the marginal frequencies for the five kids in the table above. These are your observed frequencies.

3. Find the expected frequencies according to the null hypothesis.

Eunice	Clarence	Matilda	Horace	Betty	Total
					35

4. Calculate the chi-square statistic for the goodness-of-fit of the null hypothesis.

5. The critical value (on 4 df, with α = 5%) is 9.48. What do you conclude?

Second, test the independence between Kid and Day.

6. Write a sentence describing the null hypothesis.

7. Calculate the expected frequencies according to the null hypothesis.

Days	Eunice	Clarence	Matilda	Horace	Betty
Weekdays					
Weekends					

8. Calculate the chi-square statistic for the goodness-of-fit of the null hypothesis.

9. The critical value (again on 4 df, with α = 5%) is 9.48. What do you conclude?

Indicate the best statistical test to use for each of the following situations.

10. Ten subjects are each measured on two ordinal-scale variables. We want to know how the variables are related.

11. Two groups of 8 subjects each are measured on some variable. We want to know whether there's a difference in central tendency between the groups. Histograms for both groups show the variable is strongly skewed.

12. 500 subjects are divided equally into five groups. Every subject is measured on some variable. We want to know whether there's a difference in central tendency among the groups. Histograms show the variable has a bimodal distribution.

13. 20 subjects are measured on some ordinal-scale variable, both before and after being given some drug. We want to know whether the drug affects the average value of the dependent variable.