Section 12.3 (Modified) Intro to Hypothesis Testing and Degrees of Freedom Worksheet

Key

1) A car company claims that their Super Spiffy Sedan averages 31 mpg. You randomly select 8 Super Spiffies from local car dealerships and test their gas mileage under similar conditions. You get the following Miles Per Gallon (MPG) scores:

30 28 32 26 33 25 28 30

Write the Null and Alternate Hypotheses for this situation.

H_0 (Null) = The mean mpg is 31.

H_1 (Alternate) = The mean mpg is not 31.

2) Debbie hypothesizes that the average cost of eating out for a family of four is $83.85. She uses a convenience sample and surveys her friends. The data she collected are reported below.

79.23 90.25 67.95 81.15 64.77 80.88 59.95 88.75 92.21 73.44 78.23 56.80

Write the Null and Alternate Hypotheses for this situation.

H_0 = The mean cost of eating out for a family of four is $83.85.

H_1 = The mean cost of eating out for a family of four is not $83.85.

3) In November 1997, the Gallup Organization released the results of a poll on family values. One of the questions asked was: "For you personally, do you think it is necessary or not necessary to have a child at some point in your life in order to feel fulfilled?" Results from adults in different countries appear below.

	U.S.	India	Mexico	Canada	Germany
Yes	460	930	610	590	490
No	510	60	380	370	450
Undecided	30	10	10	40	60

Write the Null and Alternate Hypotheses for this situation.

H_0 = The need to have a child and country are independent.

H_1 = The need to have a child and country are not independent.

Give the degrees of freedom for this data table.

rows: 3
columns: 5

$(3-1)(5-1) = (2)(4) = \boxed{8}$

4) A local ice cream shop surveyed its customers on their favorite ice cream flavor. They wanted to see if gender affected flavor preference. The survey results are below.

	Male	Female
Chocolate	32	16
Vanilla	14	4
Strawberry	3	12

Write the Null and Alternate Hypotheses for this situation.

H_0 = Ice cream flavor preference and gender are independent.

H_1 = Ice cream flavor preference and gender are not independent.

Give the degrees of freedom for this data table.

rows: 3 columns: 2 $(3-1)(2-1) = (2)(1) =$ **2**

5) The counseling unit of Woodrock College is interested in the relationship between anxiety level and the need to succeed. A random sample of 200 college freshmen was taken. The freshmen were given tests to measure their anxiety level and their need to succeed.

	Anxiety Level		
Need	High	Medium	Low
High	30	40	5
Medium	17	50	33
Low	3	10	12

Write the Null and Alternate Hypotheses for this situation.

H_0 = Need to succeed + Anxiety level are independent.

H_1 = Need to succeed + Anxiety level are

Give the degrees of freedom for this data table.

rows: 3 columns: 3 $(3-1)(3-1) = (2)(2) =$ **4**

6) The students in a high school study hall class were surveyed about their political affiliations to see if their grade level affects their affiliation. The results are given below.

	Class Level			
Political Party	Freshmen	Sophomore	Junior	Senior
Democratic	1	4	5	3
Republican	4	8	4	2
Other	1	3	3	2

Write the Null and Alternate Hypotheses for this situation.

H_0 = Political Affiliation and grade level are independent.

H_1 = Political Affiliation and grade level are not independent

Give the degrees of freedom for this data table.

rows: 3 columns: 4 $(3-1)(4-1) = (2)(3) =$ **6**