Math 10 MPS - Homework 10

1. A researcher wanted to study users of smart phones and see if there has been a change in customer preference over the last 7 months. 1000 smart phone users were asked what brand of phone they were using and the results will be compared to the actual percentages (market share) from April 2013. Using a significance level of 5%, conduct a Chi-square goodness of fit test to see if there has been a change in customer preference.

Data from 7 months ago:	30% Samsung	20% Apple	50% Other
Sample from now:	360 Samsung	180 Apple	460 Other

2. In a recent SurveyUSA poll, 500 Americans adults were asked if marijuana should be legalized. The results of the poll were cross tabulated as shown in the contingency tables below. Conduct **two** tests for independence to determine if opinion about legalization of marijuana is dependent on gender or age

	Male	**Female**
Should be Legal	123	90
Should Not be Legal	127	160

	18-34	**35-54**	**55+**
Should be Legal	95	83	48
Should Not be Legal	65	126	83

3. People who are concerned about their health may prefer hot dogs that are low in salt and calories. The data contains data on the calories and sodium contained in each of 54 major hot dog brands. The hot dogs are classified by type: beef, poultry, and meat (mostly pork and beef, but up to 15% poultry meat). Minitab output is attached for two different hypothesis tests.

   a. A test for a difference in **calories** due to hot dog type will be performed.

      i. Design the test.
      ii. Fill in the missing information in the ANOVA table on the next page.
      iii. Conduct the test with an overall confidence level of 5%, including pairwise comparisons.

   b. A test for a difference in **sodium** due to hot dog type will be performed.

      i. Design the test.
      ii. Fill in the missing information in the ANOVA table on the last page.
      iii. Conduct the test with an overall confidence level of 5%, including pairwise comparisons.

One-way ANOVA: Calories versus Type

Source	DF	SS	MS	F	p-value
Type	_____	17692	_____	_____	0.000
Error	_____	28067	_____		
Total	_____	45759			

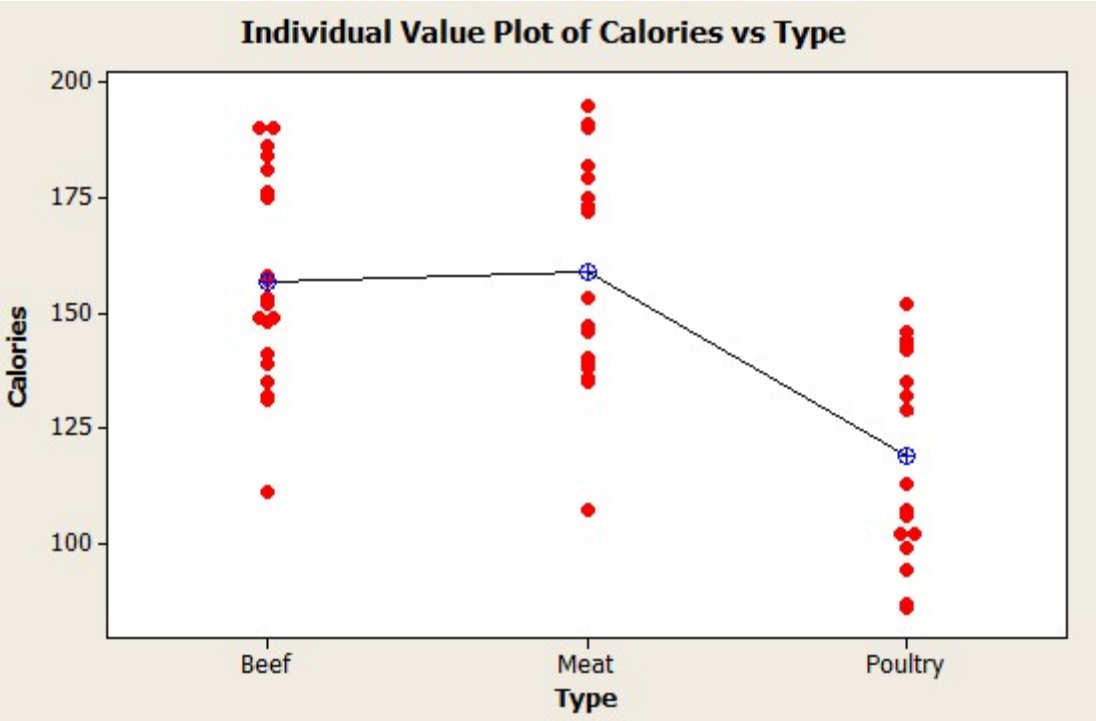
Level	N	Mean	StDev	Individual 95% CIs For Mean Based on Pooled StDev
Beef	20	156.85	22.64	(------*------)
Meat	17	158.71	25.24	(------*------)
Poultry	17	118.76	22.55	(------*------)

112 128 144 160

Grouping Information Using Tukey Method

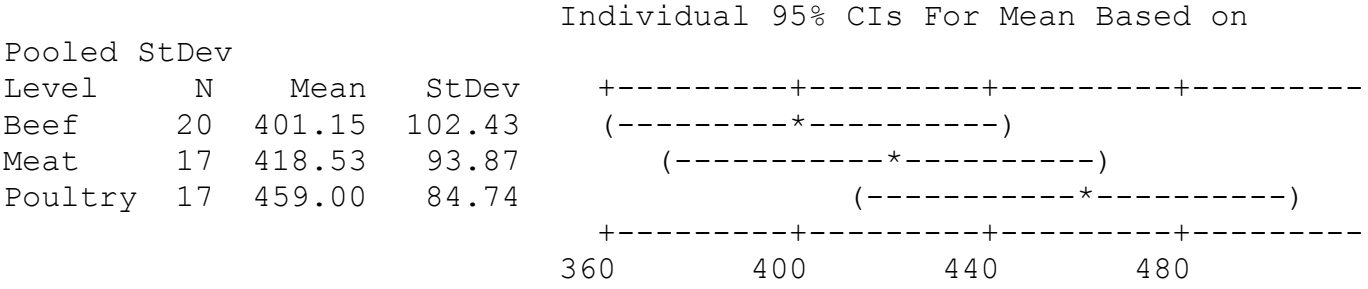
Type	N	Mean	Grouping
Meat	17	158.71	A
Beef	20	156.85	A
Poultry	17	118.76	B

Means that do not share a letter are significantly different.



One-way ANOVA: Sodium versus Type

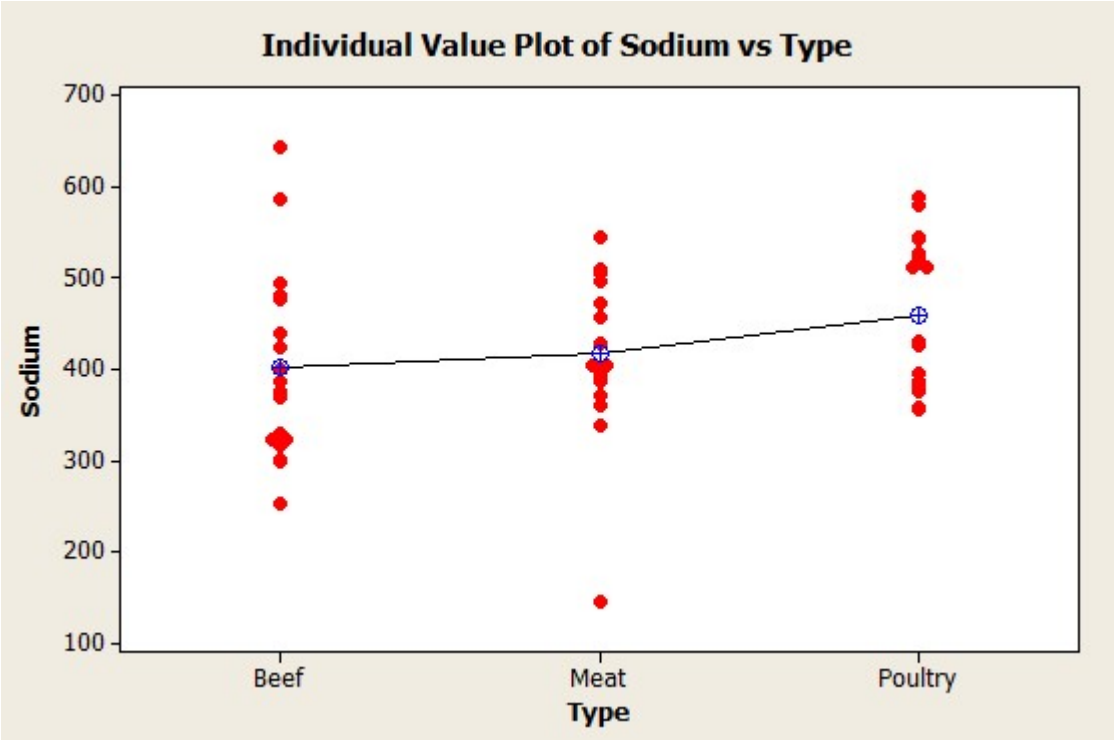
Source	DF	SS	MS	F	p-value
Type	_____	31739	_____	_____	0.179
Error	_____	455249	_____		
Total	_____	486988			



Grouping Information Using Tukey Method

Type	N	Mean	Grouping
Poultry	17	459.00	A
Meat	17	418.53	A
Beef	20	401.15	A

Means that do not share a letter are significantly different.


Individual Value Plot of Sodium vs Type
Sodium
700
600
500
400
300
200
100
Beef
Meat
Poultry
Type