In-class assignment 12 BQM Spring 2016

1. In 2015, according to <u>Statista.com</u>, the market shares of soft drinks were: non-cola soda at 19.7%, bottled water at 19.1%, cola soda at 17.7%, juice at 17.4%, energy drinks at 10%, sports drinks at 6.9%, and other at 9.2%. The following table gives the frequencies for soft drinks in a sample you conducted last week. Are the market shares the same as they were in 2015?

Soft Drink	f	e	(f-e) ² /e
non-cola soda	93		
bottled water	102		
cola soda	83		
juice	85		
energy drinks	53		
sports drinks	36		
other	48		

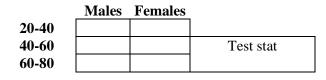
- a. State the null and the alternative hypotheses.
- b. At $\alpha = .05$, find the critical value(s).
- c. Are the assumptions of the test satisfied?
- d. Compute the expected frequencies
- e. Compute the test statistic.
- f. What is the conclusion of the test statistic?

2. A 150 individuals (males and females) were surveyed, and each was asked to indicate their yearly incomes to determine if income depends on gender. The results of the survey are shown below.

In	com	e
(:	1000	

(in 1000s)	Males	Females	TOTAL
20-40	10	30	
40-60	35	15	
60-80	15	45	
TOTAL			

	Males	Females	TOTAL
20-40			
40-60			
60-80			
TOTAL			



- a. State the null and the alternative hypotheses.
- b. At $\alpha = .05$, find the critical value(s).
- c. Are the assumptions of the test satisfied?
- d. Compute the expected frequencies
- e. Compute the test statistic.
- f. What is the conclusion of the test statistic?

Name

In-class assignment 12 BQM Spring 2016

Name			

3. Your firm is a supplier of o-rings to the next generation NASA space vehicle. In order to continue as a supplier, you have to produce 10,000 three-centimeter o-rings per year with a standard deviation less than 0.1 mm at 1% significance. Since the variance test requires the variable to be normally distributed, you need to ensure the o-ring distribution is normally distributed at 1% significance. For this test, the minimum sample size is 40.

5120 15 40.						
6.60	a. Compute the sample sta	atistics				
6.62	n = 40	$\overline{\mathbf{x}} =$	7.01	s =	0.17	
6.79						
6.80	b. With $e_{\min} = 5$ required t	for this test	, how many in	tervals will	be needed?	
6.82	k =		, ,			
6.89						
6.90	c. What is the probability	of being in	each of these	intervals?		
6.91	p =	U				
6.92	Ĩ					
6.92	d. What is the expected fr	equency of	being in each	interval?		
6.92	<i>e</i> =	1 5	U			
6.93						
6.94	e. Find the z-scores that s	plit the star	ndard normal d	listribution i	nto k equal	regions.
6.96		L			1	e
6.97	Interval	p-value	z-value			
6.97	1	•				
6.98	2					
6.99	3					
6.99						
7.00						
7.00						
7.01						
7.01						
7.03						
7.04	f. Complete the table belo	w.				
7.07	•					
7.08	interval LL	UL	f	e	$(\mathbf{f}-\mathbf{e})^2$	(f-e) ² /e
7.09	1					
7.10	2					
7.10	3					
7.12						
7.13						
7.14						
7.16						
7.19						
7.22						
7.24	g. Compute the test statist	tic.				
7.32						
7.34	h. What are the degrees of	f freedom f	or this test?			
7.34						
	i. What is the critical value for this test?					

j. What is the conclusion of this test?