AP Statistics Ch13/14 Practice

1. The paper "No evidence of Impaired Neurocognitive Performance in Collegiate Soccer Players" (*American Journal of Sports Medicine* [2002]: 157-162) compared collegiate soccer players, athletes in sports other than soccer, and a group of students who were not involved in collegiate sports with respect to history of head injuries. The table below is the result of classifying each student in independently selected random samples of 91 soccer players, 96 non-soccer athletes, and 53 non-athletes according to the number of previous concussions the student reported on a medical history questionnaire.

a) Is this a chi-squared test for homogeneity or independence? Explain why.

b) Is there evidence that the proportions for the number of concussions are the same for each student group?

	Number of Concussions				
	0	1	2	3 or more	**Total**
Soccer Players	45	25	11	10	**91**
Non-soccer athletes	68	15	8	5	**96**
Non-athletes	45	5	3	0	**53**
Total	**158**	**45**	**22**	**15**	**240**

2. The Advanced Placement (AP) Statistics examination was first administered in May 1997. Students' papers are graded on a scale of 1–5, with 5 being the highest score. Over 7,600 students took the exam in the first year, and the distribution of scores was as follows (not including exams that were scored late).

Score	5	4	3	2	1
Percent	15.3	22.0	24.8	19.8	18.1

My 2009 class that took AP Statistics had the following distribution of grades:

Score	5	4	3	2	1
Frequency	12	16	17	15	3

Is there evidence that my students' 2009 distribution of scores were different than 197 national numbers?

3. Following the debut of the new SAT writing test in March 2005, Dr. Les Perelman, from the Massachusetts Institute of Technology (MIT), stirred controversy by reporting, "It appeared to me that regardless of what a student wrote, the longer the essay, the higher the score." He went on to say, "I have never found a quantifiable predictor in 25 years of grading that was anywhere as strong as this one. If you just graded them based on length without ever reading them, you'd be right over 90 percent of the time." The table below shows the data set that Dr. Perelman used to draw his conclusions. The conditions for inference are satisfied.

a) Draw a scatterplot (describe the relationship between 2 variables), find LSRL, r, r^2 from your calculator.

b) Interpret y-intercept, slope, r, and r^2 in context.

c) Is there evidence that there is a relationship between the length, in words, of an SAT essay and the score it received? Support your answer with statistical evidence.

d) Construct a 95% confidence interval. What does the interval mean in context?

Words	460	422	402	365	357	278	236	201	168	156	133
Score	6	6	5	5	6	5	4	4	4	3	2
Words	114	108	100	403	401	388	320	258	236	189	128
Score	2	1	1	5	6	6	5	4	4	3	2
Words	67	697	387	355	337	325	272	150	135		
Score	1	6	6	5	5	4	4	2	3		