

Math 216
Preview of Chapters 5 and 6

1. The nutrition label on a bag of potato chips says that a one ounce serving of chips has 130 calories. A random sample of 55 bags yields a sample mean of 138 calories with a standard deviation of 17 calories. Is there evidence that the nutrition label does not provide an accurate measure of calories in the bags of potato chips?
2. The daily high temperature reading on January 1 was collected for 1968 and 2008 for 51 randomly selected locations in the continental United States. Then the difference between the two readings (temperature in 2008 minus temperature in 1968) was calculated for each of the 51 different locations. The average of these 51 values was 1.1 degrees with a standard deviation of 4.9 degrees. Do these data provide strong evidence of temperature warming in the continental United States?
3. The National Assessment of Educational Progress tested 13-year-old students in reading in 2004 and 2008. A random sample of 1,000 students who took the test in 2004 yielded an average score of 257 with a standard deviation of 39. A random sample of 1,000 students who took the test in 2008 yielded an average score of 260 with a standard deviation of 38. Do these data provide strong evidence that student achievement in reading nationwide improved between 2004 and 2008?
4. A report by the Centers for Disease Control and Prevention states that 30% of Americans are habitually getting less than six hours of sleep a night – less than the recommended seven to nine hours. In a simple random sample of 300 New Yorkers, it was found that 105 of them get less than six hours of sleep a night. Do these data provide strong evidence that the rate of sleep deprivation for New Yorkers is higher than the rate of sleep deprivation in the population at large?
5. According to a report on sleep deprivation by the Centers for Disease Control and Prevention, the proportion of California residents who reported insufficient rest or sleep during each of the preceding 30 days is 8.0%, while this proportion is 8.8% for Oregon residents. These data are based on simple random samples of 11,545 California and 4,691 Oregon residents. Do these data provide strong evidence that the rate of sleep deprivation is different for the two states?
6. A college newspaper article claims that students at this college spend more than an hour per day on average on social networking sites. The article is based on a survey conducted at this college on a random sample of 25 college students who use social networking sites, which yielded a sample mean of 68.2 minutes with a standard deviation of 21 minutes. Do these data provide strong evidence that students at this college who use social networking sites spend on average more than an hour (60 minutes) per day on such sites?
7. Each year the US Environmental Protection Agency (EPA) releases fuel economy data on cars manufactured in that year. Below are summary statistics on fuel efficiency (in miles/gallon) from random samples of cars with manual and automatic transmissions manufactured in 2010. Do these data provide strong evidence of a difference between the average fuel efficiency of cars with manual and automatic transmissions in terms of their average *city* mileage?

	City MPG		Hwy MPG		n
	Mean	SD	Mean	SD	
Manual	21.08	4.29	29.31	4.63	26
Automatic	15.62	2.76	21.38	3.73	26