8. Friday the 13th, II: The researchers in Exercise 7 also examined the number of people admitted to emergency rooms for vehicular accidents on 12 Friday evenings (6 each on the 6th and 13th).

Year	Month	6th	13th
1989	October	9	13
1990	July	6	12
1991	September	11	14
1991	December	11	10
1992	March	3	4
1992	November	5	12

Based on these data, is there evidence that more people are admitted on average on Friday the 13th? Here are two possible analyses of the data:

Paired t-Test of mu1 = mu2 vs. mu1 < mu2
Mean of Paired Differences = 3.333
t-Statistic = 2.7116 w/5 df
P = 0.0211

2-Sample t-Test of mu1 = mu2 vs. mu1 < mu2
Difference Between Means = 3.333
t-Statistic = 1.6644 w/9.940 df
P = 0.0636

a) Which of these tests is appropriate for these data? Explain.
b) Using the test you selected, state your conclusion.
c) Are the assumptions and conditions for inference met?

6. Rain. Simpson, Alsen, and Eden (*Technometrics* 1975) report the results of trials in which clouds were seeded and the amount of rainfall recorded. The authors report on 26 seeded and 26 unseeded clouds in order of the amount of rainfall, largest amount first. Here are two possible tests to study the question of whether cloud seeding works. Which test is appropriate for these data? Explain your choice. Using the test you select, state your conclusion.

Paired t-Test of $\mu(1-2)$
Mean of Paired Differences = -277.39615
t-Statistic = -3.641 w/25 df
p = 0.0012

2-Sample t-Test of $\mu1 - \mu2$
Difference Between Means = -277.4
t-Statistic = -1.998 w/33 df
p = 0.0538

a) Which of these tests is appropriate for these data? Explain.
b) Using the test you selected, state your conclusion.

23. Braking. In a test of braking performance, a tire manufacturer measured the stopping distance for one of its tire models. On a test track, a car made repeated stops from 60 miles per hour. The test was run on both dry and wet pavement, with results as shown in the table. (Note that actual *braking distance*, which takes into account the driver's reaction time, is much longer, typically nearly 300 feet at 60 mph!)

a) Write a 95% confidence interval for the mean dry pavement stopping distance. Be sure to check the appropriate assumptions and conditions, and explain what your interval means.

b) Write a 95% confidence interval for the mean increase in stopping distance on wet pavement. Be sure to check the appropriate assumptions and conditions, and explain what your interval means.

Stopping Distance (ft)	
Dry Pavement	Wet Pavement
145	211
152	191
141	220
143	207
131	198
148	208
126	206
140	177
135	183
133	223

25. Braking, test 2. For another test of the tires in Exercise 23, the company tried them on 10 different cars, recording the stopping distance for each car on both wet and dry pavement. Results are shown in the table.

a) Write a 95% confidence interval for the mean dry pavement stopping distance. Be sure to check the appropriate assumptions and conditions, and explain what your interval means.

b) Write a 95% confidence interval for the mean increase in stopping distance on wet pavement. Be sure to check the appropriate assumptions and conditions, and explain what your interval means.

Car #	Stopping Distance (ft)	
	Dry Pavement	Wet Pavement
1	150	201
2	147	220
3	136	192
4	134	146
5	130	182
6	134	173
7	134	202
8	128	180
9	136	192
10	158	206

19. Sex and violence. In June 2002, the *Journal of Applied Psychology* reported on a study that examined whether the content of TV shows influenced the ability of viewers to recall brand names of items featured in the commercials. The researchers randomly assigned volunteers to watch one of three programs, each containing the same nine commercials. One of the programs had violent content, another sexual content, and the third neutral content. After the shows ended, the subjects were asked to recall the brands of products that were advertised. Results are summarized below.

| | Program Type | | |
	Violent	Sexual	Neutral
No. of subjects	108	108	108
Brands recalled			
Mean	2.08	1.71	3.17
SD	1.87	1.76	1.77

(a) Conduct a hypothesis test to determine whether there is evidence that viewer memory for ads may differ between programs with sexual content and programs with neutral content.

(b) Find and interpret the confidence interval for the difference in brands recalled between sexual content programs and neutral content programs.

19. Sleep. W. S. Gosset (Student) refers to data recording the number of hours of additional sleep gained by 10 patients from the use of *laevohyoscyamine hydrobromide*. We want to see if there is strong evidence that the herb can help people get more sleep.

a) State the null and alternative hypotheses clearly.
b) A *t*-test of the null hypothesis of no gain has a *t*-statistic of 3.680 with 9 degrees of freedom. Find the P-value.
c) Interpret this result by explaining the meaning of the P-value.
d) State your conclusion regarding the hypotheses.
e) This conclusion, of course, may be incorrect. If so, which type of error was made?

23. Lower scores? Newspaper headlines recently announced a decline in science scores among high school seniors. In 2000, 15,109 seniors tested by The National Assessment in Education Program (NAEP) scored a mean of 147 points. Four years earlier, 7537 seniors had averaged 150 points. The standard error of the difference in the mean scores for the two groups was 1.22.

a) Have the science scores declined significantly? Cite appropriate statistical evidence to support your conclusion.

b) The sample size in 2000 was almost double that in 1996. Does this make the results more convincing, or less? Explain.

AP Statistics Quiz C – Chapter 24   Name_____

A total of 23 Gossett High School students were admitted to State University. Of those students, 7 were offered athletic scholarships. The school's guidance counselor looked at their composite ACT scores (shown in the table), wondering if State U. might admit people with lower scores if they also were athletes. Assuming that this group of students is representative of students throughout the state, what do you think?

1. Test an appropriate hypothesis and state your conclusion.

Composite ACT Score		
Non-athletes		**Athletes**
25	21	22
22	27	21
19	29	24
25	26	27
24	30	19
25	27	23
24	26	17
23	23	

2. Create and interpret a 90% confidence interval.

AP Statistics Quiz B – Chapter 25   *Name*_____

Most people are definitely dominant on one side of their body – either right or left. For some sports being able to use both sides is an advantage, such as batting in baseball or softball. In order to determine if there is a difference in strength between the dominant and non-dominant sides, a few switch-hitting members of some school baseball and softball teams were asked to hit from both sides of the plate during batting practice. The longest hit (in feet) from each side was recorded for each player. The data are shown in the table at the right. Does this sample indicate that there is a difference in the distance a ball is hit by batters who are switch-hitters?

1. Test an appropriate hypothesis and state your conclusion.

Dominant Side	Non-dominant Side
142	119
144	118
153	126
148	119
146	121
149	125
138	116
145	120
153	124
160	138
163	135
170	144
169	142
151	128
152	131
167	141
164	140
165	140
163	138

2. Create and interpret a 95% confidence interval.