Problem 1. A typical hour of prime-time television shows three to five violent acts. Linking family interviews and police records shows a clear association between time spent watching TV as a child and later aggressive behavior.

(a) Explain why this is an observational study rather than an experiment. What are the explanatory and response variables? (1 pts)

These data have been taken by looking, we did not impose anything that may change the behaviors of the subjects. The explanatory and response variables are time spent watching TV as a child and later aggressive behavior.

(b) Suggest several lurking variables describing a child's home life that may be related to how much TV he or she watches. Explain why this makes it difficult to conclude that more TV causes more aggressive behavior. (1 pts)

Anything that may cause a kid to watch TV, such as busy parents, babysitters, only child, etc.

Problem 2. Let $X =$ the amount of money spent per pupil in high school. Let $Y =$ the mean Verbal SAT score for students taking the SAT. Recent data show that states having an above average value for the variable $X$ tend to have below average values for the variable $Y$. In other words, there is a negative association between $X$ and $Y$. This is particularly true in states having a large percentage of all high school students taking the SAT. These states also tend to have larger populations. What is the most plausible relationship? (1 pts)  

A) Causation  
B) Common response  
C) Confounding
Problem 3. A baseball enthusiast believes pitchers who strike out a lot of batters also walk a lot of batters. He reached this conclusion by going to the library and examining the records of all major league pitchers between 1990 and 1995. What type of study is his decision based on? (2 pts)  B)

A) Anecdotal evidence.
B) An observational study based on available data.
C) An observational study based on a sample survey.
D) An experiment.

Problem 4. A committee on community relations in a college town plans to survey local businesses about the importance of students as customers. From telephone book listings, the committee chooses 150 businesses at random. Of these, 73 return the questionnaire mailed by the committee.

(a) What is the population for this sample survey? (1 pts)

The local businesses from the phone book listings is the population.

(b) What is the sample? (1 pts)

The sample is the 150 of these that were chosen.

Problem 5. Sickle-cell disease is a painful disorder of the red blood cells that in the United States affects mostly African-Americans. To investigate whether the drug hydroxyurea can reduce the pain associated with sickle-cell disease, a study by the National Institutes of Health gave the drug to 150 sickle-cell sufferers and a placebo to another 150. The researchers then counted the number of episodes of pain reported by each subject.

(a) What is the experiment unit in this study? (1 pts)

300 Subjects (Human Beings)

(b) How many treatments in this study? (1 pts)

Two Treatments (drug hydroxyurea and placebo )

(c) What is the response variable in this study? (1 pts)

The number of episodes of pain