Midterm (Practice)

First Name	Last Name_

1. Consider the following observations on shear strength of a joint bonded in a particular manner:

30	33	66	81	22	40	16	73	36	4	110

a) Determine the values of the sample mean, sample variance and sample median. (20 points)

- b) Calculate a trimmed mean by deleting the smallest and largest observations. (5 points)
- 2. A sample of 20 glass bottles of a particular type was selected, and the internal pressure strength of each bottle was determined. Consider the following sample information:

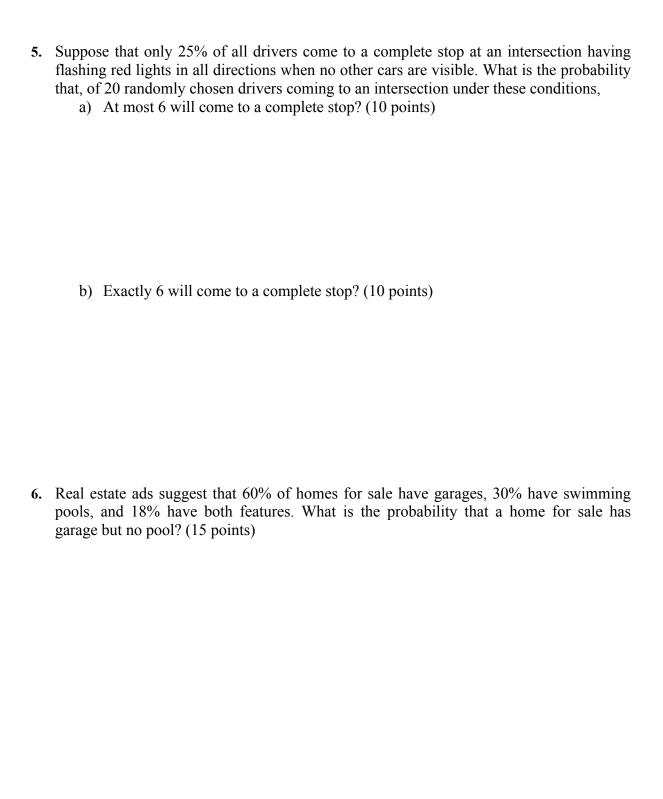
Median = 202 Lower fourth (i.e., Q1) = 196 Upper fourth (i.e., Q3) = 216

Three smallest observations: 125, 188, 194

Three largest observations: 221, 230, 250

Are there any outliers in the sample? Any extreme outliers? (15 points)

3.	A box in a certain supply room contains four 40-W lightbulbs, five 60-W bulbs, and six 75-W bulbs. Suppose that three bulbs are randomly selected. What is the probability that exactly three of the selected bulbs are rated 75-W? (15 points)
4.	Police often set up sobriety checkpoints—roadblocks where drivers are asked a few brief
	questions to allow the officer to judge whether or not the person may have been drinking. If the officer does not suspect a problem, drivers are released to go on their way.
	Otherwise, drivers are detained for a Breathalyzer test that will determine whether or not they will be arrested. The police say that based on the brief initial stop, trained officers
	can make the right decision 80% of the time. Suppose the police operate a sobriety checkpoint after 9 p.m. on a Saturday night, a time when national traffic safety experts
	suspect that about 12% of drivers have been drinking. a) What's the probability that any given driver will be detained? (15 points)
	b) What's the probability that a driver who is detained has actually been drinking?
	(15 points)



7.	You draw a card from a deck. If you get a red card, you win nothing. If you got a spade, you win \$5. For any club, you win \$10 plus an extra \$20 for the ace of clubs. Define random variable X as the amount you win at one game. a) What is the pmf of X? (15 points)
	b) Find expected value and standard deviation of X. (15 points)