Stat 171 - Worksheet for Section 4.1

Name: _____

1. Decide whether the random variable x is discrete or continuous. Determine whether x represents counted data or measured data, make a conclusion, and explain your reasoning.

   - $x =$ The number of Fortune 500 companies that lost money in the previous year.

   - $x =$ The volume of gasoline in a 21-gallon tank.

   - $x =$ Speed of a rocket.

   - $x =$ The number of calves born on a farm in one year.

2. A Company tracks the number of sales new employees make each day during a 100-day probationary period. The results for one new employee are shown. construct and graph a probability distribution by
   - Finding the probability of each outcome,
   - Organizing the probabilities in a probability distribution, and
   - Graphing the probability distribution using a histogram.

x	0	1	2	3	4	5	6	7
$P(x)$								

Sales per day, x	Number of days, f
0	16
1	19
2	15
3	21
4	9
5	10
6	8
7	2

3. Verify that the above distribution is a probability distribution.

4. Determine whether the followings are probability distributions. Explain.

x	5	6	7	8
$P(x)$	0.3	0.4	0.5	-0.2

x	5	6	7	8
$P(x)$	0.3	0.4	0.5	0.2

x	5	6	7	8
$P(x)$	0.3	0.4	0.1	0.2

5. Find $\mu = \frac{\sum x \cdot f}{n}$ for Problem 2.

x	0	1	2	3	4	5	6	7	$\sum$
f	19	16	15	21	9	10	8	2	
$x.f$									

6. Find $\mu = \sum x \cdot P(x)$ for Problem 2, and compare it with the results of Problem 5.

x	0	1	2	3	4	5	6	7	$\sum$
$x.P(x)$									

7. Find the Variance and the standard deviation for the probability distribution in Problem 2.

x	$P(x)$	$x - \mu$	$(x-\mu)^2$	$(x-\mu)^2 P(x)$
0				
1				
2				
3				
4				
5				
6				
7				
$\sum$				

8. In a mini-roulette game, the wheel has 5 numbers 0, 1, 2, 3, and 4, marked on equally spaced slots. If a player bets $1 on a number and wins, then the player keeps the dollar and receives an additional $3. Otherwise the dollar is lost. Find the expected value of the gain.

Gain, x	$P(x)$	$xP(x)$
$\sum$		