Name:

Elementary Statistics **HW 5.2 Part 3**

Use the following data to answer questions 1-2: For 200 births, the probability of exactly 90 girls is 0.0208 and the probability of 90 or fewer girls is 0.089.

1. Is exactly 90 girls in 200 births unlikely? Why or why not?

2. Among 200 births, is 90 girls an unusually low number of girls? Why or why not?

For questions 3-8, use the following probability distribution that describes the results from groups of 10 births from 10 different sets of parents. The random variable x represents the number of girls among 10 children.

Number of girls, x	P(x)	$x \cdot P(x)$	$x^2 \cdot P(x)$
0	0.001		
1	0.010		
2	0.044		
3	0.117		
4	0.205		
5	0.246		
6	0.205		
7	0.117		
8	0.044		
9	0.010		
10	0.001		

3. Find the mean number of girls out of 10 births.

4. Find the standard deviation for the number of girls out of 10 births.

5. What is the probability of getting exactly 8 girls out of 10 births?

6. What is the probability of getting 8 or more girls out of 10 births?

7. Using the rare event rule of inferential statistics, is 8 an unusually high number of girls out of 10 births? Why or why not?

8. Using the range rule of thumb, identify a range of values containing the usual numbers of girls born out of 10 births. Based on the result, would 8 girls be considered an unusual number of girls born? Explain.

9. **In Maine's Pick 4 lottery game, you can pay $1 to select a sequence of four digits, such as 1332. (Remember that a digit is a number from 0 to 9 and this lottery allows repetitions of digits). If you select the same sequence of four digits that are drawn, you win and collect $5000.**

    a. How many different selections are possible?

    b. What is the probability of winning?

    c. If you win, what is your net profit?

    d. Find the expected value.

    e. If you bet $1 in Maine's pick 3 games, the expected value is -$0.50. Which bet is better: A $1 bet in the Maine Pick 3 game or a $1 bet in the Maine Pick 4 game? Explain.