Your Name: _____

Math 140: Statistics
Test 2, March 27, 2008

1. (8 pts.) The correlation coefficient for the first table is 0.7857. Give the correlation coefficient for each of the remaining tables. You should use either the given correlation coefficient or your knowledge of correlation coefficients to find these without doing any real calculations.

x	*y*
1	2
2	3
3	1
4	4
5	6
6	5
7	7

x1	*y1*
1	–4
2	–6
3	–2
4	–8
5	–12
6	–10
7	–14

x2	*y2*
1	6
2	7
3	5
4	8
5	10
6	9
7	11

x3	*y3*
3	1
4	2
2	3
5	4
7	5
6	6
8	7

x4	*y4*
1	–1
2	–2
3	–3
4	–4
5	–5
6	–6
7	–7

   a) *x1* and *y1*

   b) *x2* and *y2*

   c) *x3* and *y3*

   d) *x4* and *y4*

2. (6 pts.) Find the standard deviation for each of the following sets of data using the short-cut method presented in Chapter 17:

   a) –1, –1, –1, 5, 5, 5

   b) 0, 0, 0, 0, 5

3. (16 pts.) A hypothetical study of working couples yielded the following results:.

Husband's Income:	Average = $54,000,	SD = $39,000	
Wife's Income:	Average = $33,000,	SD = $26,000,	r=0.25

a) When estimating the wife' income from the husband's, what is the slope of the regression line?

b) What is the intercept of the regression line?

c) Write the equation of the regression line.

d) If a husband makes $75,000, use the regression line to estimate his wife's income. Show your work!

4. (6 pts.) Using the data from the previous problem and the *regression technique*, estimate the income of a husband whose wife earns $72,000.

5. (12 pts.) In a hypothetical study, the following results were obtained:

   Age 25: Average = 100, SD = 12
   Age 40: Average = 90, SD = 15, r = 0.6

   a) What is your estimate of the score at age 40 given no additional information?

   b) What is the r.m.s. error of your estimate?

   c) If someone scores 82 at age 25, estimate their score at 40.

   d) What is the r.m.s. error of this estimate?

6. (6 pts.) For the data in the previous problem, estimate the percentile rank for those individual at 40 that were in the 75^{th} percentile at 25.

7. (12 pts.) In a hypothetical study, the following results were obtained:

Father's Weight at 21:	Average = 182,	SD = 12	
Son's Weight at 21:	Average = 188,	SD = 15,	r = 0.8

   a) What percentage of the fathers weigh over 200 pounds?

   b) For the father's that weigh 200 pounds, what percentage of their sons weigh over 200 pounds?

8. (6 pts.) A fair coin is flipped repeatedly.

   a) You win a dollar if there are between 40% and 60% heads. Which is better: 10 flips or 100 flips?

   b) You win a dollar if there are more that 60% heads. Which is better: 10 flips or 100 flips?

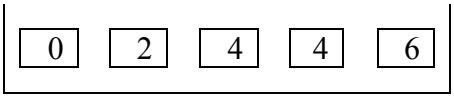
   c) You win a dollar if there are exactly 50% heads. Which is better: 10 flips or 100 flips?

9. (8 pts.) Give a box model based on a standard deck of 52 cards for each of the following:

   a) You win $3 if you draw a red face card and you lose $1 if you draw any other card.

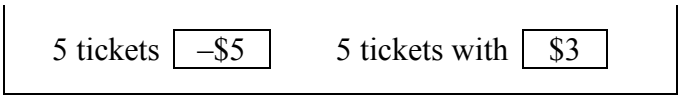
   b) You win $2 for a face card, win $1 for a nine or ten, and lose $1 for any other card.

10. (8 pts.) If 400 draws with replacement are made from the box:



what is the chance of getting between 70 and 90 sixes?

11. (12 pts.) If you make 100 random draws with replacement from the following box:



a) what is the expected sum?

b) what are the smallest and largest possible sums?

c) what is the standard error for this process?

d) what is the chance of actually winning some money?

Pledged: _____