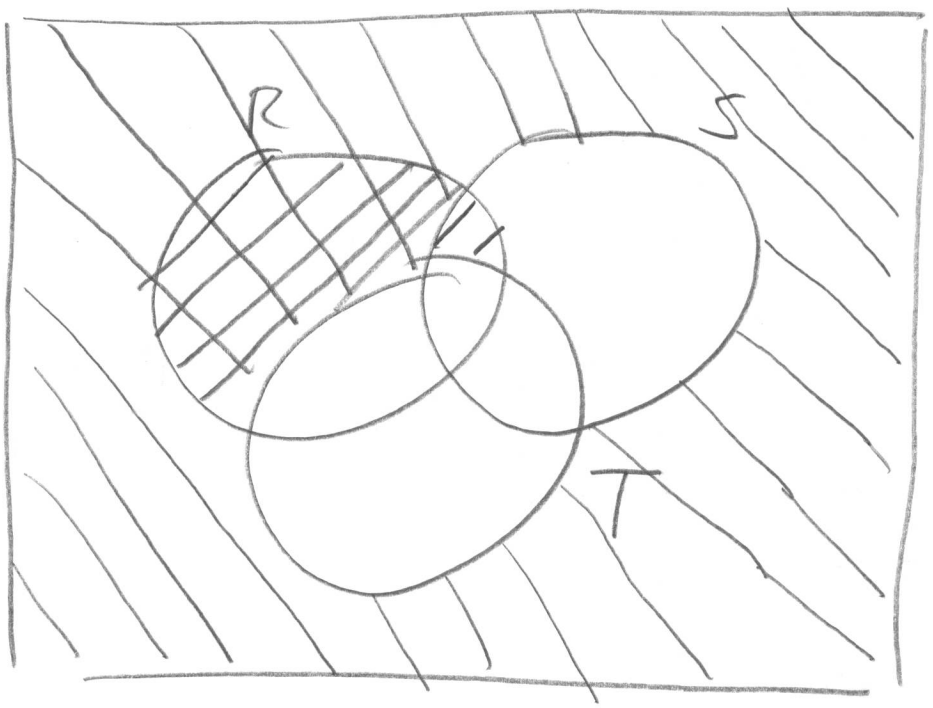
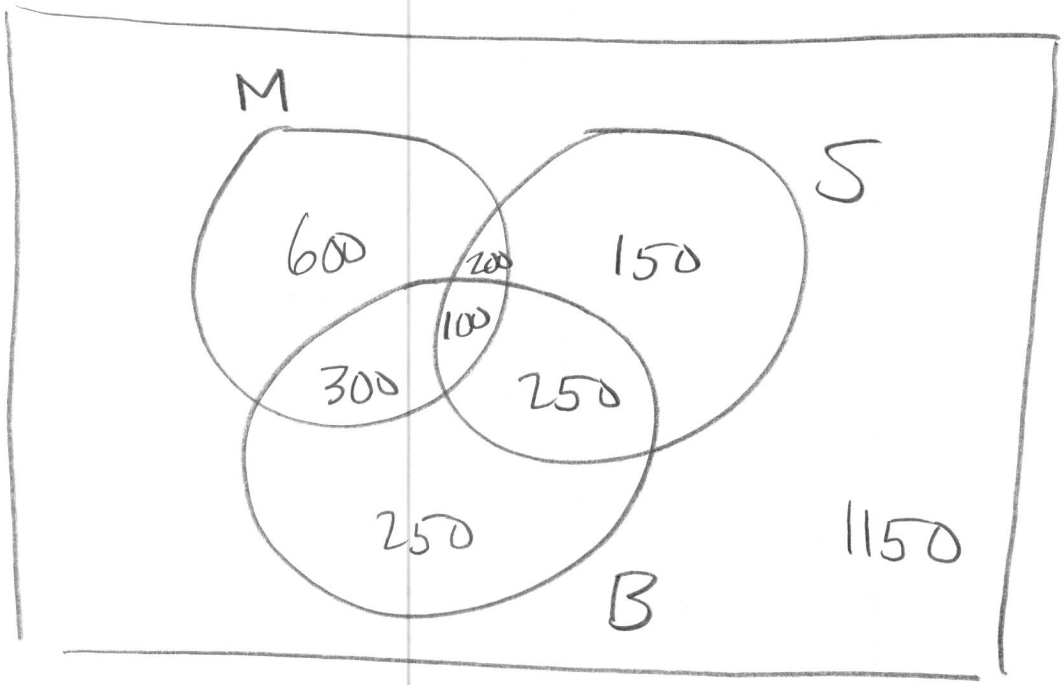
Math 141
Test 2
October 21, 2011
CWID: PURPLE

1. Draw a three-circle Venn diagram and shade the portion corresponding to the set $(R \cup S') \cap T'$.



2. Of the 3000 students at Pepperdine University, 300 are male and from Seattle, 400 are males and majoring in business, 350 are Business majors and from Seattle, 1200 students are male, 700 are from Seattle, and 900 are Business majors. In addition, there are 100 males from Seattle and who are majoring in Business. Find the number of students who are
   a. Seattle native not majoring in Business.
   b. Male from Seattle not majoring in Business.



a) 350

b) 200

3. Two couples attend a movie together and sit in the same row. How many seating arrangements are possible if
    a. Only one of the couples sits together?
    b. Both women sit together?

a) $2 \times 2 \times 2$

b) $3 \times 2 \times 2$

4. Determine the following:
    a. The number of ways to create two committees of 10 people each that can be formed from 20 available people.
    b. The number of ways to choose 9 books from a collection of 20 and place them in order on a bookshelf.

a) $C_{20\ 10} \times C_{10\ 10}$

b) $P_{20\ 9}$

5. In how many ways can a residence director assign six students to three dorm rooms if
   a. One room is a triple, one is a double, and last is a single.
   b. There are three double occupancy rooms.

a) $C(6,3) \times C(3,2) \times C(1,1)$

b) $C(6,2) \times C(4,2) \times C(2,2)$

6. How many subsets of the set {1, 2, 3, 4, 5}
   a. Do not contain an odd digit?
   b. Contain at most 4 numbers?

a) 2^2

b) $2^5 - 1$

7. Students at UCLA are polled to determine how many classes they skip each week, resulting in the following table:

# Skipped Classes	Probability
0	.1
at most 1	.3
at most 2	.6
at most 3	.8
at most 4	.95
at most 5	1.00

Based on this information, determine the probability that a randomly chosen student skips

a) Exactly 4 classes.
b) at most 3 classes.

a) .15

b) .8

8. Joe is having a dinner party for 12 guests. He has 20 male friends and 14 female friends. Assume that he invites the 12 guests at random. What is the probability that
   a. Only men are invited?
   b. At least three men are invited?

a) $\dfrac{{}_{20}C_{12}}{{}_{34}C_{12}}$

b) $1 - \left(\dfrac{{}_{14}C_{12}}{{}_{34}C_{12}} + \dfrac{{}_{14}C_{11}\,{}_{20}C_{1}}{{}_{34}C_{12}} + \dfrac{{}_{14}C_{10}\,{}_{20}C_{2}}{{}_{34}C_{12}} \right)$

9. A pollster gathers data on voter registration, resulting in the following table:

	Democrat	Republican	Libertarian
Age 30 and under	100	200	400
Age over 30 and under 40	350	700	1500
Age 40 or older	250	500	900

Determine

a) The probability of someone being 40 or older, given that they are Republican.
b) Whether being age 30 or less is independent of being Libertarian.

a) $\frac{500}{1400}$

b) $P(\leq 30 \mid L) = \frac{400}{2800} = \frac{1}{7}$

$P(\leq 30) = \frac{700}{4900} = \frac{1}{7}$ > Independent