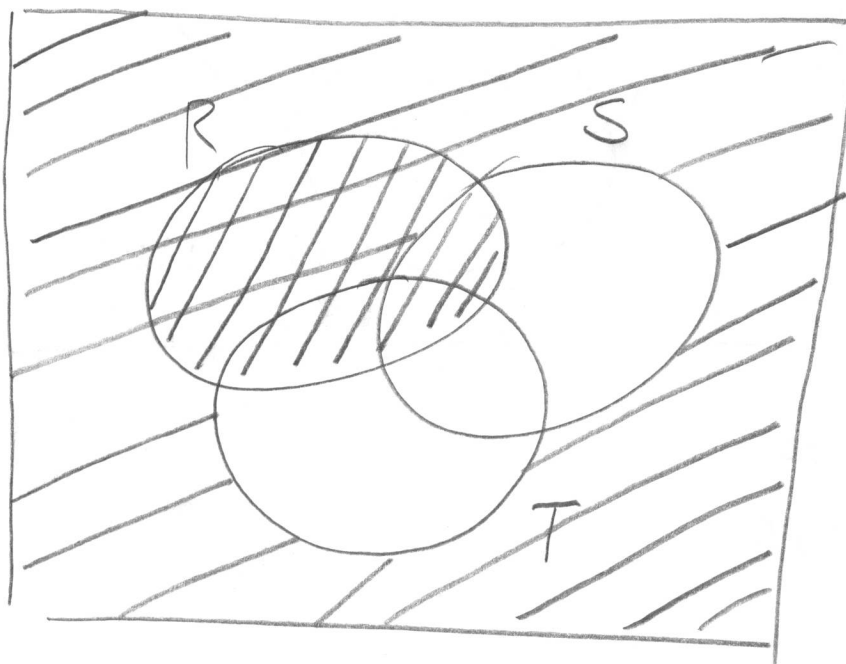


Math 141  
Test 2  
October 21, 2011  
CWID: BLUE

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

$$= R \cup (S \cup T)'$$



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
- Male, from Seattle, and not majoring in Business.
  - Female, not from Seattle, and not majoring in Business.



- 200
- 1150

3. Four couples attend a movie together and sit in the same row. How many seating arrangements are possible if
- Each of the couples sit together?
  - All men sit together?

a) 
$$P_{44} \times 2^4$$

b) 
$$5 \times P_{44} \times P_{44}$$

4. Determine the following:

- a. The number of committees of 5 people that can be formed from 12 available people.
- b. The number of ways to choose 9 books from a collection of 20 and place them in order on a bookshelf.

$$a) \quad {}_{12}C_5$$

$$b) \quad {}_{20}P_9$$

5. In how many ways can a residence director assign six students to four dorm rooms if
- Two rooms are doubles and two rooms are singles.
  - One room is a triple, one a double, and one a single.

$$a) \quad 6 \times 5 \times \binom{4}{2} \times \binom{2}{2}$$

$$b) \quad 6 \times \binom{5}{2} \times \binom{3}{3}$$

6. How many subsets of the set  $\{1, 2, 3, 4, 5, 6\}$
- Do not contain an odd digit?
  - Contain at least two numbers?

a)  $2^3$

b)  $2^6 - (1 + 6)$

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        |

| # skipped | probability |
|-----------|-------------|
| 0         | .1          |
| 1         | .2          |
| 2         | .3          |
| 3         | .2          |
| 4         | .15         |
| 5         | .05         |

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

- Exactly 3 classes.
- 2 or more classes.

a) .2

b) .7

8. Joe is having a dinner party for 12 guests. He has 20 male friends and 14 female friends, including Clara and Emily. Assume that he invites the 12 guests at random. What is the probability that

- Both Clara and Emily are invited?
- At least one woman is invited?

$$a) \quad \frac{{}^{32}C_{10}}{{}^{34}C_{12}}$$

$$b) \quad 1 - \frac{{}^{20}C_{12}}{{}^{34}C_{12}}$$

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.

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

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

$$P(\leq 30) = \frac{700}{4900} = \frac{1}{7} \quad \text{independent}$$