

Math 302/Stat 302 Problem Set I
Due January 12

Problems from textbook

page 12 # 2.1, 2.2

page 19 # 2.5, 2.6, 2.10

Other Problems

- I) The résumés of two male applicants for a college teaching position in psychology are placed in the same file as the résumés of two female applicants. Two positions become available and the first, at the rank of assistant professor, is filled by selecting one of the four applicants at random. The second position, at the rank of instructor, is then filled by selecting at random one of the three remaining applicants.
- List the elements of the sample space S .
 - List the elements of the event A that the position of assistant professor is filled by a male applicant.
 - List the elements of the event B that exactly one of the two positions is filled by a male applicant.
 - List the elements of the event C that neither position was filled by a male applicant.
 - Sketch a Venn diagram to show the relationship among the events A , B , C and S .
- II) If $S = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9\}$ and $A = \{0, 2, 4, 6, 8\}$, $B = \{1, 3, 5, 7, 9\}$, $C = \{2, 3, 4, 5\}$ and $D = \{1, 6, 7\}$, list the elements of
- | | | |
|------------------------------|---------------------------|----------------------|
| (a) $A \cup C$ | (b) AB | (c) \overline{C} |
| (d) $(\overline{C}D) \cup B$ | (e) $\overline{U \cup C}$ | (f) $AC\overline{D}$ |
- III) Let A , B and C be events in some sample space S . Using Venn diagrams, shade the areas representing the following events.
- | | | |
|---------------------|---------------------------|-------------------|
| (a) $A\overline{B}$ | (b) $\overline{A \cup B}$ | (c) $(AC) \cup B$ |
|---------------------|---------------------------|-------------------|
- IV) A box contains 500 envelopes, of which 50 contain \$100 in cash, 100 contain \$25 and 350 contain \$10. An envelope may be purchased for \$25. What is the sample space for the different amounts of money? Assign weights to the sample points and then find the probability that the first envelope purchased contains less than \$100.
- V) If A and B are mutually exclusive events and $P(A) = 0.4$ and $P(B) = 0.5$, find
- | | | |
|-------------------|-----------------------|------------------------|
| (a) $P(A \cup B)$ | (b) $P(\overline{A})$ | (c) $P(\overline{A}B)$ |
|-------------------|-----------------------|------------------------|