Print then work on it directly. Staple HW 2-1, 2-2, 2-3 together.

**Problem 1**

**2.6** From a survey of 60 students attending a university, it was found that 9 were living off campus, 36 were undergraduates, and 3 were undergraduates living off campus. Find the number of these students who were

    **a** undergraduates, were living off campus, or both.

    **b** undergraduates living on campus.

    **c** graduate students living on campus.

**Problem 2**

**2.11**   A sample space consists of five simple events, $E_1$, $E_2$, $E_3$, $E_4$, and $E_5$.

    **a**   If $P(E_1) = P(E_2) = 0.15$, $P(E_3) = 0.4$, and $P(E_4) = 2P(E_5)$, find the probabilities of $E_4$ and $E_5$.

    **b**   If $P(E_1) = 3P(E_2) = 0.3$, find the probabilities of the remaining simple events if you know that the remaining simple events are equally probable.

**Problem 3**

**2.14**   A survey classified a large number of adults according to whether they were diagnosed as needing eyeglasses to correct their reading vision and whether they use eyeglasses when reading. The proportions falling into the four resulting categories are given in the following table:

| Needs glasses | Uses Eyeglasses for Reading | |
|---|---|---|
| | Yes | No |
| Yes | .44 | .14 |
| No | .02 | .40 |

If a single adult is selected from the large group, find the probabilities of the events defined below. The adult

**a**   needs glasses.

**b**   needs glasses but does not use them.

**c**   uses glasses whether the glasses are needed or not.

## Problem 4

**2.15**  An oil prospecting firm hits oil or gas on 10% of its drillings. If the firm drills two wells, the four possible simple events and three of their associated probabilities are as given in the accompanying table. Find the probability that the company will hit oil or gas

  **a**  on the first drilling and miss on the second.

  **b**  on at least one of the two drillings.

| Simple Event | Outcome of First Drilling | Outcome of Second Drilling | Probability |
|---|---|---|---|
| $E_1$ | Hit (oil or gas) | Hit (oil or gas) | .01 |
| $E_2$ | Hit | Miss | ? |
| $E_3$ | Miss | Hit | .09 |
| $E_4$ | Miss | Miss | .81 |

**Problem 5** Exercise 2.5(a) and (b) mean Problem 1 (3 an 4) in HW1-2.

If $A$ and $B$ are events, use the result derived in Exercise 2.5(a) and the Axioms in Definition 2.6 to prove that

$$P(A) = P(A \cap B) + P(A \cap \overline{B}).$$

If $A$ and $B$ are events and $B \subset A$, use the result derived in Exercise 2.5(b) and the Axioms in Definition 2.6 to prove that

$$P(A) = P(B) + P(A \cap \overline{B}).$$

If $A$ and $B$ are events and $B \subset A$, why is it "obvious" that $P(B) \leq P(A)$?

## Problem 6

**2.29**  Two additional jurors are needed to complete a jury for a criminal trial. There are six prospective jurors, two women and four men. Two jurors are randomly selected from the six available.

    **a**  Define the experiment and describe one sample point. Assume that you need describe only the two jurors chosen and not the order in which they were selected.

    **b**  List the sample space associated with this experiment.

    **c**  What is the probability that both of the jurors selected are women?