

**Problem 1:** Suppose two balanced coins are tossed and the upper faces are observed.

- List the sample points for this experiment.
- Assign a reasonable probability to each sample point.
- Let  $A$  denote the event that exactly one head is observed and  $B$  the event that at least one head is observed. List the sample points in both  $A$  and  $B$ .
- From your answer to part(c), find  $P(A)$ ,  $P(B)$ ,  $P(A \cap B)$ ,  $P(A \cup B)$ , and  $P(A^c \cup B)$ .

**Problem 2:** Consider two boxes, one contains 1 black and 1 white ball and the other has 2 black and 1 white. A box is selected at random, and a ball is drawn.

- What is the probability that the ball drawn is black?
- What is the probability that the first box was selected given that the white ball was drawn?

**Problem 3:** If two fair dice are rolled, what is the conditional probability that the first one is 5 given that the sum is  $i$ . Compute for all  $i$  where  $i$  varies from 2 through 12.

**Problem 4:** A student answers a multiple-choice examination question that offers four possible answers. Suppose the probability that the student knows the answer to the question is .8 and the probability that the student will guess is .2. Assume that if the student guesses, the probability of selecting the correct answer is .25. If the student correctly answers a question, what is the probability that the student really knew the correct answer?

**Problem 5:**

For a certain population of employees, the percentage passing or failing a job competency exam, listed according to sex, were as shown in the accompanying table. That is, of all the people taking the exam, 24% were in the male-pass category, 16% were in the male-fail category, and so forth. An employee is to be selected randomly from this population. Let  $A$  be the event that the employee scores a passing grade on the exam and let  $M$  be the event that a male is selected.

Outcome	Sex		Total
	Male ( $M$ )	Female ( $F$ )	
Pass ( $A$ )	24	36	60
Fail ( $\bar{A}$ )	16	24	40
Total	40	60	100

- Are the events  $A$  and  $M$  independent?
- Are the events  $\bar{A}$  and  $F$  independent?

**Problem 6:** Textbook End of Chapter 1 Problems, Question 6

**Problem 7:** Textbook End of Chapter 1 Problems, Question 7

**Problem 8:** *Textbook End of Chapter 1 Problems, Question 8*

**Problem 9:** *Textbook End of Chapter 1 Problems, Question 9*

**Problem 10:** *Textbook End of Chapter 1 Problems, Question 12*

**Problem 11:** *Textbook End of Chapter 1 Problems, Question 13*

**Problem 12:** *Textbook End of Chapter 1 Problems, Question 15*

**Problem 13:** *Textbook End of Chapter 1 Problems, Question 19*

**Problem 14:** *Textbook End of Chapter 1 Problems, Question 24*

**Problem 15:** *Textbook End of Chapter 1 Problems, Question 30*