CH5 Find the indicated probability.
1) A bag contains 6 red marbles, 3 blue marbles, and 5 green marbles.
    a) If a marble is randomly selected from the bag, what is the probability that it is blue?
    b) If a marble is randomly selected what is the probability it is red?
    c) If two marbles are selected what is the probability both are green? (with replacment)
    d) If two marbles are selected what is the prob the first is red and second is green? (with replacment)
    e) If two marbles are selected what is the prob the first is red and second is green? (without replacment)
    F) write the sample space for 2 selections (Hint: make a tree diagram)

2) The table below describes the smoking habits of a group of asthma sufferers.

	Nonsmoker	Occasional smoker	Regular smoker	Heavy smoker	Total
Men	334	50	68	32	484
Women	357	30	89	37	513
Total	691	80	157	69	997

    a) If one of the 997 people is randomly selected, find the probability of getting a regular or heavy smoker.
    b) What is the probability a person is a heavy smoker and male.

3) The table below describes the smoking habits of a group of asthma sufferers.

	Nonsmoker	Occasional smoker	Regular smoker	Heavy smoker	Total
Men	431	50	71	49	601
Women	382	48	86	39	555
Total	813	98	157	88	1156

    a) If one of the 1156 people is randomly selected, find the probability that the person is a man or a heavy smoker.
    b) What is the probability a person is an occasional smoker given they are a women?

4) The table below describes the smoking habits of a group of asthma sufferers.

	Nonsmoker	Light smoker	Heavy smoker	Total
Men	390	34	42	466
Women	446	35	44	525
Total	836	69	86	991

If two different people are randomly selected from the 991 subjects, find the probability that they are both heavy smokers. Treat as dependent events. Round to six decimal places.

5) The table below describes the smoking habits of a group of asthma sufferers.

	Nonsmoker	Light smoker	Heavy smoker	Total
Men	425	38	35	498
Women	381	32	43	456
Total	806	70	78	954

If two different people are randomly selected from the 954 subjects, find the probability that they are both women. Without replacment. Round to four decimal places.

6) According to Statistical Abstract of the United States, about 29% of all 18 to 25 year olds are current marijuana users.
(a) What is the probability that four randomly selected 18 to 25 year olds are all marijuana users?
(b) What is the probability that four randomly selected 18 to 25 year olds are all not marijuana users?
(c) What is the probability that among four randomly selected 18 to 25 year olds at least one is a marijuana user?

7) A IRS auditor randomly selects 3 tax returns from 49 returns of which 7 contain errors.
a) What is the probability that she selects all three containing errors?
b) What is the probability that she selects none of those containing errors?
c) What is the probability that she selects at least one containing an error?

8) Mutually exclusive (or disjoint) events are events that cannot occure at the same time.
a) Give an example of mutually excusive events
b) Give an example of events that are not mutually exclusive

9) Independent events are events where the outcome of one does not affect the other. If events are not independent then they are dependent.
a) Give an example independent events .
b) Give an example of dependent events.

10) A license plate is designed so that the first two characters are letters and the last four characters are digits. How many different license plates can be formed
a) assuming that letters and numbers can be used more than once?
b) assuming that letters and numbers cannont be used more than once?

11) Kristen needs to make a group of 5 people. She has 10 Democrats and 13 Republicans.
a) How many different groups can she make?
b) How many gropus can she make if she must select 3 democrats and 2 republicans?
c) How many groups can she make if there will be the following positions assigned; Chair, vice chair, treasure, secutary and speaker?
d) What is the probability that the group of 5 people will have 4 Democrats and 1 Republicans?

CH 6. Discrete and Binomial Probabilities
12) The number of oil spills occurring off the Alaskan coast
    A) Continuous   B) Discrete

13) The height of a randomly selected student
    A) Continuous   B) Discrete

Determine whether the following is a probability distribution. If not, identify the requirement that is not satisfied.If it is the find the mean and standard deviation.
14) The number of golf balls ordered by customers of a pro shop has the following probability distribution.

x	P(x)
3	0.14
6	0.29
9	0.36
12	0.11
15	0.10

Determine whether the given procedure results in a binomial distribution. If not, state the reason why.

15) Rolling a single die 26 times, keeping track of the numbers that are rolled.

16) Choosing 8 marbles from a box of 40 marbles (20 purple, 12 red, and 8 green) one at a time with replacement, keeping track of the number of red marbles chosen.

Find the indicated probability.

17) Suppose that 14% of people are left handed. If 9 people are selected at random, what is the probability that exactly 2 of them are left handed?

18) In a certain college, 33% of the physics majors belong to ethnic minorities. If 10 students are selected at random from the physics majors, that is the probability that no more than 6 belong to an ethnic minority?

19) A tennis player makes a successful first serve 51% of the time. Assuming that each serve is independent of the others. If she serves 9 times,
a) what is the probability that she gets exactly 3 first serves in?
b) what is the probability that she gets more than 3 first serves in?
c) what is the probability that she gets at least 3 first serves in?
d) what is the probability that she gets at most 3 first serves in?
e) what is the probability that she gets fewer than 3 first serves in?
f) find the mean and standard deviation.
g) would 6 successful serves be unusual? would 1? WHY?

CH7 Normal Distributions

20) A continuous random variable X is uniformly distributed from 0 to 10.
(a) What is the probability that X will be less than 3?
(b) What is the probability that X will be between 4 and 8?

21) Suppose that Dunlop Tire manufactures a tire with a lifetime that follows a normal distribution with mean 70,000 miles and standard deviation of 4400 miles.
(a) What percent of tires will last at least 75,000 miles?
(b)If Dunlop warrants the tires for 60,000 miles. What percent of tires will last 60,000 miles or less?
(c) What is the probability that a randomly selected Dunlop tire will last between 65,000 and 80,000 miles?
(d) Suppose that Dunlop wants to warrant no more than 2% of its tires. What mileage should the company advertise as its warranty mileage?

22) The waist circumference of males 20 to 29 year
s old is approximately normally distributed, with mean 92.5 cm and standard deviation 13.7 cm.
(a) What proportion of 20 to 29 year old males will have a waist circumference that is less than 100 cm?
(b) What is the probability that a randomly selected 20 to 29 year old male will have a waist circumference between 80 and 100 cm?
(c) Determine the waist circumferences that represent the middle 90% of all waist circumferences.
(d) Determine the waist circumference that is at the 10th percentile.

1) a) P(B)=.2143
   b) P(R)=.4286
   c) P(G1 and G2)=.1276
   d) P(R1 and G2)=.1531
   e) P(R1 and G2)=.1648
   f) S ={ RB,RG,RR,BG,BR,BB,GR,GB,GG}
2) 0.227 ; .0321
3) 0.554; .0865
4) 0.007451
5) 0.2282
6) .0071, .2541, .7459
7) .0019, .6231, .3769
8)
9)
10) 6760000, 3276000
11) 23C5=33649, 10C3 13C2 =9360, 23P5=4037880, (10C4 13C1)/23C5 =.0811
12) B
13) A
14) yes, $\mu = 8.22$, sigma=3.41
15) Not binomial: there are more than two outcomes for each trial.
16) Procedure results in a binomial distribution.
17) 0.245
18) 0.982
19) .3091; .4015; .7107; .5985; .2893
    f) mean=4.59, s.d.=1.50
    g) no within 2 s.d., yes since it is more than 2 s.d.
20) .30, .40
21) .1279, .0115,.8606, 60964mi
22) .7080, .5272, 70cm and 115cm ,80cm