MATH STATISTICS – Review 2 CH 4–6 SHOW WORK FOR FULL CREDIT

Name_____

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)

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) A batch consists of 12 defective coils and 88 good ones. Find the probability of getting two good coils when two coils are randomly selected if the first selection is replaced before the second is made.

7) A bin contains 64 light bulbs of which 10 are defective. If 5 light bulbs are randomly selected from the bin with replacement, find the probability that all the bulbs selected are good ones. Round to the nearest thousandth if necessary.

8) A IRS auditor randomly selects 3 tax returns from 49 returns of which 7 contain errors. What is the probability that she selects none of those containing errors? Round to four decimal places.

Find the mean of the given probability distribution.

9)

x	P(x)
0	0.26
1	0.11
2	0.16
3	0.05
4	0.42

10) 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

Find the indicated probability for the following binomial distibutions. Round to three decimal places.

11) A test consists of 10 true/false questions. To pass the test a student must answer at least 6 questions correctly. If a student guesses on each question, what is the probability that the student will pass the test?

12) 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?

13) A tennis player makes a successful first serve 51% of the time. If she serves 9 times, what is the probability that she gets exactly 3 first serves in? Assume that each serve is independent of the others.

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14) A tennis player makes a successful first serve 53% of the time. Assuming that each serve is independent of the others. If she serves 6 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?

Find the mean, μ, for the binomial distribution which has the stated values of n and p. Round answer to the nearest tenth.

15) $n = 38$; $p = 0.2$

16) $n = 676$; $p = 0.7$

Find the standard deviation, σ, for the binomial distribution which has the stated values of n and p. Round your answer to the nearest hundredth.

17) $n = 29$; $p = 0.2$

18) $n = 2219$; $p = 0.63$

If z is a standard normal variable, find the probability. graph, shade and label the normal distribution.

19) $P(z > 0.59)$

20) The probability that z is greater than –1.82

21) $P(z < 0.97)$

22) The probability that z is less than 1.13

23) $P(-0.73 < z < 2.27)$

24) The probability that z lies between –1.10 and –0.36

Assume that X has a normal distribution, and find the indicated probability. graph, shade and label the normal distribution.

25) The mean is $\mu = 60.0$ and the standard deviation is $\sigma = 4.0$.
Find the probability that X is less than 53.0.

26) The mean is $\mu = 15.2$ and the standard deviation is $\sigma = 0.9$.
Find the probability that X is greater than 17.

27) The mean is $\mu = 22.0$ and the standard deviation is $\sigma = 2.4$.
Find the probability that X is between 19.7 and 25.3.

Find the indicated probability. graph, shade and label the normal distribution.

28) The volumes of soda in quart soda bottles are normally distributed with a mean of 32.3 oz and a standard deviation of 1.2 oz. What is the probability that the volume of soda in a randomly selected bottle will be less than 32 oz?

29) The weekly salaries of teachers in one state are normally distributed with a mean of $490 and a standard deviation of $45.
a) What is the probability that a randomly selected teacher earns more than $525 a week?
b) what is the cutoff salary for the bottom 40% of teachers.
c)What is the cut off for the top 20% of teachers.

Find the indicated probability.

30) A bank's loan officer rates applicants for credit. The ratings are normally distributed with a mean of 200 and a standard deviation of 50.
a) If an applicant is randomly selected, find the probability of a rating that is between 170 and 220.
b) What is the cutoff score for the bottom 30%? the top 30%?

Solve the problem. graph, shade and label the normal distribution.

31) The annual precipitation amounts in a certain mountain range are normally distributed with a mean of 109 inches, and a standard deviation of 10 inches. What is the probability that the mean annual precipitation during 25 randomly picked years will be less than 111.8 inches?

32) The scores on a certain test are normally distributed with a mean score of 60 and a standard deviation of 5. What is the probability that a sample of 90 students will have a mean score of at least 60.527?

1) a) $P(b)=\frac{3}{14}$,

b) $P(r)=\frac{3}{7}$

c) P(GG)=.1276

d) P(RG)=.1531

e) P(B2 | R1)=.1648

2) 0.227 ; .0321

3) 0.554; .0865

4) 0.007451

5) 0.2282

6) 0.7744

7) 0.428

8) 0.6231

9) $\mu = 2.26$

10) $\mu = 8.22$

11) 0.377

12) 0.982

13) 0.154

14) .3091; .4015; .7107; .5985; .2893

15) $\mu = 7.6$

16) $\mu = 473.2$

17) $\sigma = 2.15$

18) $\sigma = 22.74$

19) 0.2776

20) 0.9656

21) 0.8340

22) 0.8708

23) 0.7557

24) 0.2237

25) 0.0401

26) 0.0228

27) 0.7477

28) 0.4013

29) 0.2177; $478.60 ; $527.87

30) 0.3811 ; 174 ; 226

31) 0.9192

32) 0.1587