

Chapter 5 Worksheet

Math 160

Name _____

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Identify the given random variable as being discrete or continuous.

1) The number of oil spills occurring off the Alaskan coast 1) _____

2) The height of a randomly selected student 2) _____

Determine whether the following is a probability distribution. If not, identify the requirement that is not satisfied.

3) 3) _____

x	P(x)
1	0.037
2	0.200
3	0.444
4	0.296

4) 4) _____

x	P(x)
0	0.079
1	0.173
2	-0.030
3	0.170
4	0.075
5	0.533

5) 5) _____

x	P(x)
0	0.17
1	0.44
2	0.11
3	0.12
4	0.16

Find the mean and standard deviation of the given probability distribution.

6) The random variable x is the number of houses sold by a realtor in a single month at the Sendsom's Real Estate office. Its probability distribution is as follows. 6) _____

Houses Sold (x)	Probability P(x)
0	0.24
1	0.01
2	0.12
3	0.16
4	0.01
5	0.14
6	0.11
7	0.21

Answer the question.

- 7) Focus groups of 14 people are randomly selected to discuss products of the Yummy Company. It is determined that the mean number (per group) who recognize the Yummy brand name is 10.9, and the standard deviation is 0.98. Would it be unusual to randomly select 14 people and find that fewer than 7 recognize the Yummy brand name?

7) _____

- 8) Suppose that voting in municipal elections is being studied and that the accompanying tables describes the probability distribution for four randomly selected people, where x is the number that voted in the last election. Is it unusual to find four voters among four randomly selected people?

8) _____

x	$P(x)$
0	0.23
1	0.32
2	0.26
3	0.15
4	0.04

Assume that a researcher randomly selects 14 newborn babies and counts the number of girls selected, x . The probabilities corresponding to the 14 possible values of x are summarized in the given table. Answer the question using the table.

Probabilities of Girls

$x(\text{girls})$	$P(x)$	$x(\text{girls})$	$P(x)$	$x(\text{girls})$	$P(x)$
0	0.000	5	0.122	10	0.061
1	0.001	6	0.183	11	0.022
2	0.006	7	0.209	12	0.006
3	0.022	8	0.183	13	0.001
4	0.061	9	0.122	14	0.000

- 9) Find the probability of selecting 9 or more girls.

9) _____

- 10) Find the probability of selecting 2 or more girls.

10) _____

Provide an appropriate response.

- 11) The prizes that can be won in a sweepstakes are listed below together with the chances of winning each one: \$3800 (1 chance in 8600); \$1700 (1 chance in 5400); \$700 (1 chance in 4600); \$200 (1 chance in 2600). Find the expected value of the amount won for one entry if the cost of entering is 55 cents. 11) _____

Assume that a procedure yields a binomial distribution with a trial repeated n times. Use the binomial probability formula to find the probability of x successes given the probability p of success on a single trial. Round to three decimal places.

- 12) $n = 5, x = 2, p = 0.70$ 12) _____

- 13) $n = 64, x = 3, p = 0.04$ 13) _____

Find the indicated probability.

- 14) The brand name of a certain chain of coffee shops has a 55% recognition rate in the town of Coffleton. An executive from the company wants to verify the recognition rate as the company is interested in opening a coffee shop in the town. He selects a random sample of 10 Coffleton residents. Find the probability that the number that recognize the brand name is not 4. 14) _____

- 15) In a survey of 300 college graduates, 58% reported that they entered a profession closely related to their college major. If 6 of those survey subjects are randomly selected without replacement for a follow-up survey, what is the probability that 3 of them entered a profession closely related to their college major? 15) _____

Find the indicated probability. Round to three decimal places.

16) 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? 16) _____

17) 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? 17) _____

18) A company purchases shipments of machine components and uses this acceptance sampling plan: Randomly select and test 30 components and accept the whole batch if there are fewer than 3 defectives. If a particular shipment of thousands of components actually has a 6% rate of defects, what is the probability that this whole shipment will be accepted? 18) _____

19) In a study, 42% of adults questioned reported that their health was excellent. A researcher wishes to study the health of people living close to a nuclear power plant. Among 11 adults randomly selected from this area, only 3 reported that their health was excellent. Find the probability that when 11 adults are randomly selected, 3 or fewer are in excellent health. 19) _____

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

20) $n = 671$; $p = 0.7$ 20) _____

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.

21) $n = 715$; $p = 0.7$

21) _____

Solve the problem.

22) A company manufactures batteries in batches of 26 and there is a 3% rate of defects. Find the mean number of defects per batch.

22) _____

23) A company manufactures batteries in batches of 26 and there is a 3% rate of defects. Find the standard deviation for the number of defects per batch.

23) _____

Determine if the outcome is unusual. Consider as unusual any result that differs from the mean by more than 2 standard deviations. That is, unusual values are either less than $\mu - 2\sigma$ or greater than $\mu + 2\sigma$.

24) A survey for brand recognition is done and it is determined that 68% of consumers have heard of Dull Computer Company. A survey of 800 randomly selected consumers is to be conducted. For such groups of 800, would it be unusual to get 465 consumers who recognize the Dull Computer Company name?

24) _____

Answer Key

Testname: CH_5_WKSHT

- 1) Discrete
- 2) Continuous
- 3) Not a probability distribution. The sum of the $P(x)$'s is not 1, since $0.977 \neq 1.000$.
- 4) Not a probability distribution. One of the $P(x)$'s is negative.
- 5) Probability distribution.
- 6) $\mu = 3.60$
- 7) Yes
- 8) Yes
- 9) 0.212
- 10) 0.999
- 11) \$0.44
- 12) 0.132
- 13) 0.221
- 14) 0.840
- 15) 0.289
- 16) 0.377
- 17) 0.982
- 18) 0.732
- 19) 0.251
- 20) $\mu = 469.7$
- 21) $\sigma = 12.25$
- 22) 0.8
- 23) 0.9
- 24) Yes