Houston Communtiy College
Statistics
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Exam 2

Name_____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Use the basic counting rule to solve the problem.

1) License plates are made using 2 letters followed by 3 digits. How many plates can be made if repetition of letters and digits is allowed?
   A) 67,600 B) 676,000 C) 100,000 D) 11,881,376

Solve the problem.

2) There are 9 members on a board of directors. If they must elect a chairperson, a secretary, and a treasurer, how many different slates of candidates are possible?
   A) 504 B) 362,880 C) 729 D) 84

3) The library is to be given 5 books as a gift. The books will be selected from a list of 21 titles. If each book selected must have a different title, how many possible selections are there?
   A) 5.109094217e+19 B) 2,441,880 C) 20,349 D) 4.257578514e+17

4) A pool of possible jurors consists of 10 men and 13 women. How many different juries consisting of 5 men and 7 women are possible?
   A) 1,352,078 B) 8 C) 432,432 D) 1

Find the indicated probability.

5) If two balanced die are rolled, the possible outcomes can be represented as follows.

(1, 1) (2, 1) (3, 1) (4, 1) (5, 1) (6, 1)
(1, 2) (2, 2) (3, 2) (4, 2) (5, 2) (6, 2)
(1, 3) (2, 3) (3, 3) (4, 3) (5, 3) (6, 3)
(1, 4) (2, 4) (3, 4) (4, 4) (5, 4) (6, 4)
(1, 5) (2, 5) (3, 5) (4, 5) (5, 5) (6, 5)
(1, 6) (2, 6) (3, 6) (4, 6) (5, 6) (6, 6)

Determine the probability that the sum of the dice is 6 or 9.
A) $\frac{1}{4}$ B) $\frac{5}{18}$ C) $\frac{2}{9}$ D) $\frac{11}{36}$

Provide an appropriate response.

6) Which of the following could not possibly be probabilities?

A. –0.04
B. $\frac{12}{7}$
C. 0
D. 0.91

A) A and B B) A and C C) A and D D) B and C

Determine the number of outcomes that comprise the specified event.

7) The number of hours needed by sixth grade students to complete a research project was recorded with the following results.

Hours	Number of students (f)
4	20
5	25
6	27
7	10
8	14
9	5
10+	8

A student is selected at random. The event A is defined as follows.

A = the event the student took between 5 and 9 hours inclusive

Determine the number of outcomes that comprise the event (not A).

A) 28 B) 30 C) 8 D) 58

Determine whether the events are mutually exclusive.

8) The number of hours needed by sixth grade students to complete a research project was recorded with the following results.

Hours	Number of students (f)
4	15
5	11
6	19
7	6
8	9
9	16
10+	2

A student is selected at random. The events A, B, and C are defined as follows.

A = event the student took more than 9 hours
B = event the student took less than 6 hours
C = event the student took between 7 and 9 hours inclusive

Is the collection of events A, B, and C mutually exclusive?

A) Yes B) No

Find the indicated probability.

9) A bag contains 6 red marbles, 3 blue marbles, and 5 green marbles. If a marble is randomly selected from the bag, what is the probability that it is blue?

A) $\frac{1}{6}$ B) $\frac{1}{3}$ C) $\frac{1}{5}$ D) $\frac{3}{14}$

Find the indicated probability by using the special addition rule.

10) A relative frequency distribution is given below for the size of families in one U.S. city.

Size	Relative frequency
2	0.386
3	0.249
4	0.191
5	0.120
6	0.034
7+	0.020

A family is selected at random. Find the probability that the size of the family is between 2 and 5 inclusive. Round approximations to three decimal places.

A) 0.826 B) 0.946 C) 0.506 D) 0.44

Use the general multiplication rule to find the indicated probability.

11) You are dealt two cards successively (without replacement) from a shuffled deck of 52 playing cards. Find the probability that the first card is a king and the second card is a queen.

A) $\frac{2}{13}$ B) $\frac{4}{663}$ C) $\frac{1}{663}$ D) $\frac{13}{102}$

Use the special multiplication rule to find the indicated probability.

12) In a homicide case 8 different witnesses picked the same man from a lineup. The lineup contained 5 men. If the identifications were made by random guesses, find the probability that all 8 witnesses would pick the same person.

A) 0.0000305 B) 0.0000128 C) 0.0000026 D) 0.0000242

Find the indicated probability by using the general addition rule.

13) In one city, 49.6% of adults are female, 10.7% of adults are left–handed, and 5.0% are left–handed females. For an adult selected at random from the city, let

F = event the person is female
L = event the person is left–handed.

Find P(F or L). Round approximations to three decimal places.

A) 0.504 B) 0.603 C) 0.553 D) 0.710

Find the conditional probability.

14) If a single fair die is rolled, find the probability of a 5 given that the number rolled is odd.

A) $\frac{1}{6}$ B) $\frac{1}{3}$ C) $\frac{1}{2}$ D) $\frac{2}{3}$

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

	Nonsmoker	Light smoker	Heavy smoker	Total
Men	375	61	64	500
Women	312	80	77	469
Total	687	141	141	969

If one of the 969 subjects is randomly selected, find the probability that the person chosen is a nonsmoker given that the person is a woman.

A) 0.322 B) 0.454 C) 0.484 D) 0.665

Find the mean of the random variable.

16) The random variable X is the number that shows up when a loaded die is rolled. Its probability distribution is given in the table.

x	P(X = x)
1	0.14
2	0.12
3	0.15
4	0.14
5	0.16
6	0.29

A) 3.50 B) 3.80 C) 4.02 D) 3.93

Find the expected value of the random variable.

17) Suppose you buy 1 ticket for $1 out of a lottery of 1,000 tickets where the prize for the one winning ticket is to be $500. What is your expected value?

A) –$1.00 B) –$0.40 C) $0.00 D) –$0.50

Find the standard deviation of the random variable.

18) A police department reports that the probabilities that 0, 1, 2, and 3 burglaries will be reported in a given day are 0.52, 0.37, 0.08, and 0.03, respectively. Find the standard deviation for the probability distribution.

A) 0.76 B) 0.58 C) 1.05 D) 0.98

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

Find the indicated binomial probability. Be sure to follow the steps outlined below.

1. Identify a success
2. Determine the success probability, p.
3. Determine n, the number of trials.
4. Write the formula you will use to obtain the desired probability, for example $P(X = 3) = \binom{5}{3}(0.3)^3(0.7)^2 = 0.1323$.

19) A company manufactures calculators in batches of 64 and there is a 4% rate of defects. Find the probability of getting exactly three defects in a batch.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Find the indicated probability.

20) A car insurance company has determined that 5% of all drivers were involved in a car accident last year. Among the 14 drivers living on one particular street, 3 were involved in a car accident last year. If 14 drivers are randomly selected, what is the probability of getting 3 or more who were involved in a car accident last year?

A) 0.9741 B) 0.5177 C) 0.0300 D) 0.0259

Find the mean of the binomial random variable.

21) The probability that a radish seed will germinate is 0.7. A gardener plants seeds in batches of 5. Find the mean for the random variable X, the number of seeds germinating in each batch.

A) 3.55 B) 3.5 C) 1.5 D) 4.5

Find the standard deviation of the binomial random variable.

22) The probability that a radish seed will germinate is 0.7. A gardener plants seeds in batches of 15. Find the standard deviation for the random variable X, the number of seeds germinating in each batch.

A) 1.754 B) 1.715 C) 1.694 D) 1.775