Exam3 review

Name_____

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

Insert "⊆" or "⊄" in the blank to make the statement true.
     1) {2, 4, 6} __ {1, 2, 3, 4, 6}   1) _____

Find the number of subsets of the set.
     2) {math, English, history, science, art}   2) _____

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

Decide whether the statement is true or false.
     3) $\{0\} \cap \varnothing = \{0\}$ 3) _____

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

Let U = {q, r, s, t, u, v, w, x, y, z}; A = {q, s, u, w, y}; B = {q, s, y, z}; and C = {v, w, x, y, z}. List the members of the indicated set, using set braces.
     4) $A' \cup B$ 4) _____

     5) $C' \cup A'$ 5) _____

Let U = {all soda pops}; A = {all diet soda pops}; B = {all cola soda pops}; C = {all soda pops in cans}; and D = {all caffeine-free soda pops}. Describe the given set in words.
     6) $A' \cap C$ 6) _____

Write the sample space for the given experiment.
     7) A box contains 13 white cards numbered 1 through 13. One card with a number greater than 6 is chosen.   7) _____

For the experiment described, write the indicated event in set notation.
     8) A die is tossed twice with the tosses recorded as an ordered pair. Represent the following event as a subset of the sample space: The first toss shows a six.   8) _____

A die is rolled twice. Write the indicated event in set notation.
     9) The sum of the rolls is 5.   9) _____

Find the probability of the given event.
     10) A card drawn from a well-shuffled deck of 52 cards is a red ace.   10) _____

     11) A bag contains 5 red marbles, 3 blue marbles, and 1 green marble. A randomly drawn marble is not blue.   11) _____

Use the given table to find the probability of the indicated event. Round your answer to the nearest thousandth.

12) College students were given three choices of pizza toppings and asked to choose one favorite. The following table shows the results.

toppings	freshman	sophomore	junior	senior
cheese	10	12	24	21
meat	22	21	12	10
veggie	12	10	22	21

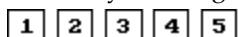A randomly selected student prefers a meat topping.

12) _____

Solve the problem.

13) A single die is rolled one time. Find the probability of rolling a number greater than 2 or less than 5.

13) _____

Suppose P(C) = .048, P(M ∩ C) = .044, and P(M ∪ C) = .524. Find the indicated probability.

14) P(M')

14) _____

Find the odds in favor of the indicated event.

15) Randomly drawing a 5 from the cards pictured below.

| 1 | 2 | 3 | 4 | 5 |

15) _____

Convert the odds that the given event will occur to the probability that the event will occur.

16) The odds in favor of winning a particular lottery are 1 to 2,000,000.

16) _____

Identify the probability statement as empirical or not.

17) The probability of curing a certain type of cancer if detected early is .70.

17) _____

An experiment is conducted for which the sample space is S = {a, b, c, d}. Decide if the given probability assignment is possible for this experiment.

18)

Outcomes	Probabilities
a	.41
b	.15
c	.10
d	.44

18) _____

Solve the problem.

19) A survey revealed that 25% of people are entertained by reading books, 48% are entertained by watching TV, and 27% are entertained by both books and TV. What is the probability that a person will be entertained by either books or TV? Express the answer as a percentage.

19) _____

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

20) _____

21) If two cards are drawn without replacement from an ordinary deck, find the probability that the second card is an ace, given that the first card was an ace.

21) _____

Assume that two marbles are drawn without replacement from a box with 1 blue, 3 white, 2 green, and 2 red marbles. Find the probability of the indicated result.

22) The second marble is red, given that the first marble is white.

22) _____

23) Both marbles are green.

23) _____

Find the probability.

24) If 81% of scheduled flights actually take place and cancellations are independent events, what is the probability that 3 separate flights will take place?

24) _____

25) A family has five children. The probability of having a girl is $\frac{1}{2}$. What is the probability of having at least 4 girls? Round the answer to the fourth decimal place.

25) _____

Prepare a probability distribution for the experiment. Let x represent the random variable, and let P represent the probability.

26) Four cards are drawn from a deck. The number of red tens is counted.

26) _____

Give the probability distribution and sketch the histogram.

27) A class of 44 students took a 10–point quiz. The frequency of scores is given in the table.

27) _____

Number of Points	Frequency
5	2
6	5
7	10
8	15
9	9
10	3
	Total: 44

Find the expected value of the random variable in the experiment.

28) Three coins are tossed, and the number of tails is noted.

28) _____

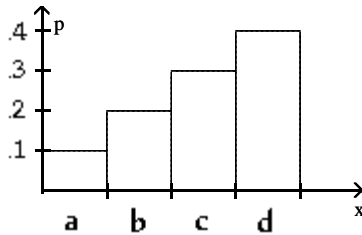**Find the expected value for the random variable.**

29)

x	2	3	4	5
P(x)	0.3	0.3	0.1	0.3

29) _____

Find the expected value for the random variable x having this probability function.

30)

a = 12   b = 13
c = 14   d = 15

30) _____

Solve the problem.

31) Suppose you buy 1 ticket for $1 out of a lottery of 1000 tickets where the prize for the one winning ticket is to be $500. What are your expected winnings?

31) _____

32) If 5 apples in a barrel of 25 apples are rotten, what is the expected number of rotten apples in a sample of 2 apples?

32) _____

Use the multiplication principle to solve the problem.

33) How many different 5–digit sequences can be formed using the digits 0, 1,...,7 if repetition of digits is allowed?

33) _____

34) How many different 4–letter radio station call letters can be made if repeats are allowed and the first letter must be K.

34) _____

35) A shirt company has 4 designs each of which can be made with short or long sleeves. There are 5 color patterns available. How many different types of shirts are available from this company?

35) _____

Solve the problem.

36) From 7 names on a ballot, 3 will be elected to a political party committee. In how many ways can the committee of 3 be formed if each person will have a different responsibility?

36) _____

37) There are 10 members on a board of directors. If they must form a subcommittee of 3 members, how many different subcommittees are possible?

37) _____

38) Five cards are drawn at random from an ordinary deck of 52 cards. In how many ways is it possible to draw two red aces and two black jacks?

38) _____

39) From a group of 17 women and 14 men, a researcher wants to randomly select 7 women and 7 men for a study. In how many ways can the study group be selected?

39) _____

40) Three student representatives, a president, a secretary, and a treasurer, are to be chosen from a group of five students: Andrew, Brenda, Chad, Dorothy, and Eric. In how many different ways can the representatives be chosen if the president must be a woman and the secretary and treasurer must be men?

40) _____

41) Awards are to be presented to seven people: Jeff, Karen, Lyle, Maria, Norm, Olivia, and Paul. How many different orders are possible for the awards if Karen is to receive the first award and Lyle the last?

41) _____

42) A bag contains 2 blue, 2 red, and 3 green marbles. Four marbles are drawn at random from the bag. How many different samples are possible which include at least one marble of each color?

42) _____

A bag contains 6 cherry, 3 orange, and 2 lemon candies. You reach in and take 3 pieces of candy at random. Find the probability.

43) 2 cherry, 1 lemon

43) _____

Find the probability of the following card hands from a 52–card deck. In poker, aces are either high or low. A bridge hand is made up of 13 cards.

44) In poker, a flush (5 in same suit) in any suit

44) _____

Solve the problem.

45) Estimate the probability that at least 2 of the 50 state governors have the same birthday.

45) _____

46) At the first tri–city meeting, there were 8 people from town A, 7 people from town B, and 5 people from town C. If the council consists of 5 people, find the probability of 2 from town A, 2 from town B, and 1 from town C.

46) _____

A die is rolled five times and the number of fours that come up is tallied. Find the probability of getting the given result.

47) Exactly zero fours

47) _____

In a certain college, 33% of the physics majors belong to ethnic minorities. Find the probability of the event from a random sample of 10 students who are physics majors.

48) Two or less belong to an ethnic minority.

48) _____

Find the requested probability.

49) A child rolls a 6–sided die 6 times. What is the probability of the child rolling exactly two fours?

49) _____

1) ⊆
2) 32
3) FALSE
4) {q, r, s, t, v, x, y, z}
5) {q, r, s, t, u, v, x, z}
6) All non–diet soda pops in cans
7) {7, 8, 9, 10, 11, 12, 13}
8) {(6, 1), (6, 2), (6, 3), (6, 4), (6, 5), (6, 6)}
9) {(1, 4), (2, 3), (3, 2), (4, 1)}
10) $\dfrac{1}{26}$

11) $\dfrac{2}{3}$

12) .330
13) 1
14) .480
15) 1 to 4
16) $\dfrac{1}{2,000,001}$

17) Empirical
18) No
19) 46%
20) $\dfrac{1}{3}$

21) $\dfrac{1}{17}$

22) $\dfrac{2}{7}$

23) $\dfrac{1}{28}$

24) .53
25) .1875
26)

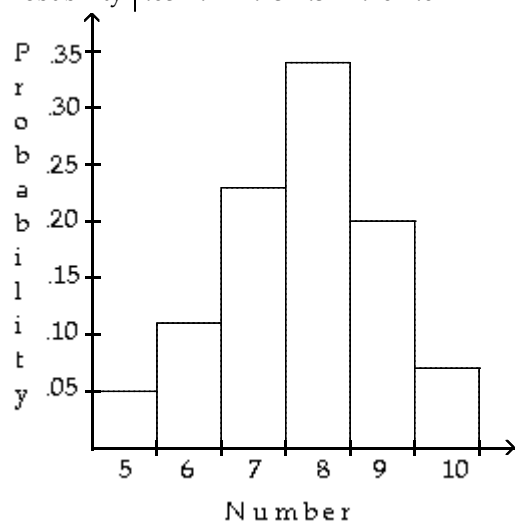| x	P
0	.851
1	.145
2	.005

27)

Number	5	6	7	8	9	10
Probability	.05	.11	.23	.34	.20	.07

28) 1.5
29) 3.4
30) 14
31) –$.50
32) .4
33) 32,768
34) 17,576
35) 40
36) 210
37) 120
38) 48 ways
39) 66,745,536
40) 12
41) 120
42) 24
43) .1818
44) .00198
45) .970
46) .190
47) .402
48) .3070
49) .2009