Mathematical Ideas Chapter 12 Review

Name_____

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

Find the probability.

1) In one town, 29% of all voters are Democrats. If two voters are randomly selected for a survey, find   1) _____
the probability that they are both Democrats.

   A) 0.580   B) 0.290   C) 0.084   D) 0.081

Solve the problem.

2) An ice cream store has 5 flavors. If we pick flavors successively at random, what is the probability   2) _____
that the flavor strawberry will be selected for the first time on pick 9? [the same flavor can be
picked more than once]

   A) 0.167772   B) 0.033554

   C) 0.000002   D) None of the above is correct.

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.

3) In bridge, 4 aces   3) _____

   A) 0.00264   B) 0.00059   C) 0.00118   D) 0.01056

Solve the problem.

4) In the past, Michael had the following success shooting free throws after being fouled. 30% of the   4) _____
time he got 0 points, 30%, of the time 1 point, and 40% of the time 2 points. How could the digits
0-9 be distributed among these three possibilities to simulate the probabilities of shooting 0, 1, and
2 points?

   A) 0 - 3 = 0 points, 4 - 6 = 1 point, and 7 - 9 = 2 points

   B) 0 - 2 = 0 points, 3 - 6 = 1 point, and 7 - 9 = 2 points

   C) 0 - 2 = 0 points, 3 - 5 = 1 point, and 6 - 9 = 2 points

   D) Not possible to create a simulation with the digits 0 - 9.

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.

5) In bridge, all cards in one suit   5) _____

   A) 0.00000000000314   B) 0.0000000000314

   C) 0.00000000000630   D) 0.00000000000157

Find the probability.

6) When two balanced dice are rolled, there are 36 possible outcomes. What is the probability that the   6) _____
sum of the numbers on the dice is 6 or 10?

   A) $\dfrac{1}{60}$ B) $\dfrac{4}{3}$ C) $\dfrac{2}{9}$ D) $\dfrac{4}{9}$

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.

7) In poker, a full house (3 cards of one value, 2 of another value)　　　　　7) _____

   A) 0.0000385　　　　　B) 0.00655　　　　　C) 0.00144　　　　　D) 0.00000920

Find the probability.

8) A fair die is rolled. What is the probability of rolling a 3 or a 5?　　　　　8) _____

   A) $\frac{1}{3}$　　　　　B) $\frac{1}{6}$　　　　　C) $\frac{1}{36}$　　　　　D) 2

Decide whether or not the events are mutually exclusive.

9) Events A and B defined as follows　　　　　9) _____
Event A is that at least three of Toni's five cousins are female.
Event B is that at least three of Toni's five cousins are male.

   A) No　　　　　　　　　　　　B) Yes

Use counting rules to determine the probability.

10) Determine the probability that in a class of 8 students, at least two students have the same birthday.　10) _____
Assume that there are always 365 days in a year and that birth rates are constant throughout the year. (Hint: First determine the probability that no two students have the same birthday and then apply the complementation rule.)

   A) 0.114　　　　　B) 0.074　　　　　C) 0.154　　　　　D) 0.926

Find the probability.

11) A class consists of 13 women and 29 men. If a student is randomly selected, what is the probability　11) _____
that the student is a woman?

   A) $\frac{13}{29}$　　　　　B) $\frac{13}{42}$　　　　　C) $\frac{29}{42}$　　　　　D) $\frac{1}{42}$

Find the indicated probability.

12) In a batch of 8000 clock radios 5% are defective. A sample of 13 clock radios is randomly selected　12) _____
without replacement from the 8,000 and tested. The entire batch will be rejected if at least one of those tested is defective. What is the probability that the entire batch will be rejected?

   A) 0.513　　　　　B) 0.0500　　　　　C) 0.0769　　　　　D) 0.487

Solve the problem.

13) In the past, Michael had the following success shooting free throws after being fouled. 30% of the time he got 0 points, 30% of the time he got 1 point, and 40% of the time 2 points. Use the following set of random digits to simulate 100 free throws. Begin at the top of the first column and move down that column{1, 1, 8, etc.}, then start at the top of the second column and move down {8, 5, 9, etc.}. Use the following: 0 - 2 = 0 points, 3 - 5 = 1 point and 6 - 9 = 2 points. Estimate the probability that on a given occasion, Michael will score 2 points after being fouled.

13) _____

```
18728  94741  32063  04963
15592  71357  28152  11732
89555  75520  08882  95295
38894  58070  77371  10194
64336  95103  90740  03577
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A) $\dfrac{37}{100}$ B) $\dfrac{9}{25}$ C) $\dfrac{7}{20}$ D) $\dfrac{39}{100}$

Find the probability.

14) A family has five children. The probability of having a girl is 1/2. What is the probability of having 3 girls followed by 2 boys?

14) _____

A) $\dfrac{1}{120}$ B) $\dfrac{1}{16}$ C) $\dfrac{1}{32}$ D) $\dfrac{5}{16}$

Solve the problem.

15) If 3 boys and 2 girls are arranged at random in a row, what is the probability that two boys will not be in adjacent seats?

15) _____

A) $\dfrac{12}{5!}$ B) $\dfrac{2}{5}$ C) $\dfrac{2!}{5!}$ D) $\dfrac{3}{5!}$

16) Mendel found no dominance in snapdragons with respect to red and white flower color. When pure red (RR) and pure white (rr) parents are crossed, the resulting Rr combination (one of each gene) produces second generation offspring with pink flowers. Suppose one of these second generation pinks is crossed with a pure red. What is the probability that the resulting snapdragon will have white flowers?

16) _____

A) 0   B) 0.5   C) 0.75   D) 0.25

17) An insurance company will insure a $220,000 home for its total value for an annual premium of $510. If the company spends $30 per year to service such a policy, the probability of total loss for such a home in a given year is 0.001 and you assume either total loss or no loss will occur, what is the company's expected annual gain (or profit) on each such policy?

17) _____

A) -$220   B) $260   C) $290   D) $210

3

Find the indicated probability.

18) The age distribution of students at a community college is given below.

Age (years)	Number of students (f)
Under 21	417
21-25	414
26-30	212
31-35	50
Over 35	20
	1113

A student from the community college is selected at random. Find the probability that the student is at least 31. Round approximations to three decimal places.

A) 0.045   B) 0.063   C) 70   D) 0.937

18) _____

19) The table below shows the soft drink preferences of people in three age groups.

	cola	root beer	lemon-lime
under 21 years of age	40	25	20
between 21 and 40	35	20	30
over 40 years of age	20	30	35

If one of the 255 subjects is randomly selected, find the probability that the person is over 40 and drinks cola.

A) $\frac{4}{17}$

B) $\frac{4}{19}$

C) $\frac{4}{51}$

D) None of the above is correct.

19) _____

Determine whether the events are independent.

20) A balanced die is rolled twice. Are the events "six on first roll" and "six on the second roll" independent ?

A) No   B) Yes

20) _____

Find the expected value of the random variable.

21) The random variable X is the number of complaints per day received by a business bureau.. Find the expected number of complaints per day.

X (Complaints per Day)	0	1	2	3	4	5
Probability(X = x)	0.04	0.11	0.26	0.33	0.19	0.12

A) 2.73   B) 2.85   C) 3.01   D) 2.98

21) _____

22) The random variable X is the number of houses sold by a realtor in a single month at the Sendsom's   22) _____
Real Estate office. Its probability distribution is given in the table.

x	P(X = 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

  A) 3.40   B) 3.60   C) 3.50   D) 3.35

Solve the problem.

23) In a 2-card hand, what is the probability of holding only face cards? (Aces are not face cards.)   23) _____

  A) 0.14   B) 0.02   C) 0.09   D) 0.05

24) A batch of 100 calculators contains 5 defective calculators. If 6 calculators are selected at random   24) _____
from this batch, determine the probability that exactly two of those selected are defective.

  A) 0.0267   B) 0.0217   C) 0.0174   D) 0.0347

Find the probability.

25) A bag contains 13 balls numbered 1 through 13. What is the probability that a randomly selected   25) _____
ball has an even number?

  A) 6   B) $\frac{2}{13}$ C) $\frac{13}{6}$ D) $\frac{6}{13}$

Determine whether the events are independent.

26) Two cards are selected at random from a standard deck of 52 cards without replacement. Are the   26) _____
events "ace on the first draw" and "ace on the second draw" independent?

  A) Yes   B) No

Find the probability.

27) If you are dealt two cards successively (with replacement of the first) from a standard 52-card deck,   27) _____
find the probability of getting a face card on the first card and an ace on the second.

  A) $\frac{4}{13}$ B) $\frac{9}{169}$ C) $\frac{3}{169}$ D) $\frac{4}{221}$

Solve the problem.

28) The table shows the number of college students who prefer a given pizza topping. 28) _____

toppings	freshman	sophomore	junior	senior
cheese	10	13	21	19
meat	20	19	13	10
veggie	13	10	20	19

Find the empirical probability that a randomly selected student prefers cheese toppings.

A) 0.337   B) 0.332   C) 0.102   D) 0.302

29) The following list of digits was taken from a table of random numbers. We will let them represent 29) _____
50 tosses of 5 fair coins. The digits 0-4 represent an H and the digits 5-9 represent a T. Use this
simulation to estimate the probability of getting two heads on a toss of five coins.

18728 94741 32063 04963 54859
15592 71357 28152 11732 17173
89555 75520 08882 95295 72895
38894 58070 77371 10194 94917
64336 95103 90740 03577 62599

52052 24004 03845 11507 45233
27510 33761 86563 61729 39087
48061 59412 79969 11339 27067
27324 72723 22406 86253 26409
29970 95877 70975 99129 16866

A) $\dfrac{1}{4}$ B) $\dfrac{17}{50}$ C) $\dfrac{16}{50}$ D) $\dfrac{12}{50}$

Find the indicated probability.

30) In a blood testing procedure, blood samples from 5 people are combined into one mixture. The 30) _____
mixture will only test negative if all the individual samples are negative. If the probability that an
individual sample tests positive is 0.12, what is the probability that the mixture will test positive?

A) 0.472   B) 0.0000249   C) 1.00   D) 0.528

Solve the problem.

31) Suppose a charitable organization decides to raise money by raffling a trip worth $500. If 3,000 31) _____
tickets are sold at $1.00 each, find the expected net winnings for a person who buys 1 ticket.

A) -$1.00   B) -$0.81   C) -$0.85   D) -$0.83

Find the expected value of the random variable.

32) 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	0.10
3	0.11
4	0.15
5	0.14
6	0.36

32) _____

A) 4.00   B) 3.50   C) 4.13   D) 0.17

Solve the problem.

33) The results of a school election for student president are shown in the following table.

Candidate	A	B	C	D	E
Votes for	14	23	24	27	12

33) _____

What is the probability that a randomly polled voter voted for Candidate C?

A) 0.14   B) 0.27   C) 0.50   D) 0.24

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.

34) In bridge, 6 of one suit, 4 of another, and 3 of another

34) _____

A) 0.0022   B) 0.00055   C) 0.0060   D) 0.0133

Find the probability.

35) If a person is randomly selected, find the probability that his or her birthday is in May. Ignore leap years. Assume that all days of the year are equally likely for a given birth.

35) _____

A) $\dfrac{31}{365}$ B) $\dfrac{1}{12}$ C) $\dfrac{1}{365}$ D) $\dfrac{1}{31}$

Find the indicated probability.

36) The following table contains data from a study of two airlines which fly to Small Town, USA.

36) _____

	Number of flights which were on time	Number of flights which were late
Podunk Airlines	33	6
Upstate Airlines	43	5

If one of the 87 flights is randomly selected, find the probability that the flight selected is an Upstate Airlines flight given that it was late.

A) $\dfrac{5}{87}$ B) $\dfrac{5}{48}$

C) $\dfrac{5}{11}$ D) None of the above is correct.

Find the probability.

37) Find the probability that when a 10 question multiple choice test has 4 possible answers for each   37) _____
question, a student will select at least 6 correct answers from the 10 possible.

A) 0.995   B) 0.989   C) 0.020   D) 0.118

Anne is standing on the corner tossing a coin. She decides she will toss it 12 times, each time walking 1 block north if it lands heads up and 1 block south if it lands tails up. Find the probability that she will end up in the indicated location.

38) at least 10 blocks from her corner   38) _____

A) 0.0059   B) 0.0032   C) 0.0063   D) 0.0029

Solve the problem.

39) Suppose that we wish to distribute the four-digit random numbers from 0000 through 9999 such   39) _____
that the corresponding random numbers can be used to simulate the polluting spills in the Great Lakes. If the numbers 0000 to 2465 correspond to 0 spills, what is the estimated probability of 0 spills?

A) $\dfrac{2466}{10000}$ B) $\dfrac{2465}{10000}$ C) $\dfrac{2465}{1000}$ D) $\dfrac{2466}{1000}$

Decide whether or not the events are mutually exclusive.

40) Having good reading skills and having good math skills   40) _____

A) Yes   B) No

Solve the problem.

41) Experience shows that a ski lodge will be full (195 guests) if there is a heavy snow fall in December,   41) _____
while only partially full (66 guests) with a light snow fall. What is the expected number of guests if the probability for a heavy snow fall is .40? Assume that heavy snowfall and light snowfall are the only two possibilities.

A) 117.6   B) 117   C) 143.4   D) 78

42) From a group of 3 men and 4 women, a delegation of 2 is selected at random. What is the expected   42) _____
number of men in the delegation?

A) 1   B) 0.48   C) 0.57   D) 0.86

Find the probability.

43) A multiple choice test has 30 questions. Each question has five possible answers, of which one is   43) _____
correct. If a student guesses on every question, find the probability of getting exactly 12 correct.

A) 0.0064   B) 0.0052   C) 0.0806   D) 0.4000

44) A bag contains 6 red marbles, 3 blue marbles, and 1 green marble. What is the probability that a   44) _____
randomly selected marble is not blue?

A) $\dfrac{10}{7}$ B) $\dfrac{7}{10}$ C) $\dfrac{3}{10}$ D) 7

Solve the problem.

45) Numbers is a game where you bet $1.00 on any three-digit number from 000 to 999. If your number comes up, you get $600.00. Find the expected net winnings.

    A) -$0.42   B) -$1.00   C) -$0.50   D) -$0.40

45) _____

46) A contractor is considering a sale that promises a profit of $34,000 with a probability of .7 or a loss (due to bad weather, strikes, and such) of $10,000 with a probability of .3. What is the expected profit?

    A) $23,800   B) $20,800   C) $30,800   D) $24,000

46) _____

47) The following string of B's and G's was obtained by tossing a quarter 40 times. Heads were listed as B and tails as G. Use this simulation to estimate the probability of two girls being born in succession.
{BBGGGGGBGGBBGGGBGGBBBGBBGBBBBGGBBGGBGGBG}

    A) $\dfrac{10}{39}$ B) $\dfrac{11}{40}$ C) $\dfrac{11}{39}$ D) $\dfrac{10}{40}$

47) _____

Find the indicated probability.

48) The table shows the distribution of family size in a certain U.S. city

Family Size	Probability
2	0.405
3	0.239
4	0.203
5	0.097
6	0.040
7+	0.016

A family is selected at random from the city. Find the probability that the size of the family is less than 5. Round approximations to three decimal places.

    A) 0.097   B) 0.539   C) 0.442   D) 0.847

48) _____

Solve the problem.

49) A number cube labeled with numbers 1, 2, 3, 4, 5, and 6 is tossed. What are the odds against the cube showing a 4?

    A) 5:1   B) 6:1   C) 5:6   D) 1:5

49) _____

Find the probability.

50) 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.

    A) 0.22105   B) 0.00006   C) 0.16224   D) 0.20185

50) _____

Find the conditional probability.

51) If three cards are drawn at random without replacement from a standard deck, find the probability 51) _____
that the third card is a face card, given that the first card was a queen and the second card was a 5.

A) $\dfrac{6}{25}$
B) $\dfrac{11}{50}$
C) $\dfrac{3}{13}$
D) $\dfrac{1}{5}$

Find the indicated probability.

52) The table below shows the soft drinks preferences of people in three age groups. 52) _____

	cola	root beer	lemon-lime
under 21 years of age	40	25	20
between 21 and 40	35	20	30
over 40 years of age	20	30	35

If one of the 255 subjects is randomly selected, find the probability that the person drinks root beer given that they are over 40.

A) $\dfrac{2}{17}$
B) $\dfrac{6}{17}$

C) $\dfrac{2}{5}$
D) None of the above is correct.

Find the probability.

53) A spinner has regions numbered 1 through 18. What is the probability that the spinner will stop on 53) _____
an even number or a multiple of 3?

A) 15
B) $\dfrac{2}{3}$
C) $\dfrac{1}{3}$
D) 1

Solve the problem.

54) 54) _____
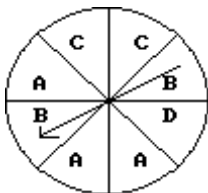
What are the odds against spinning a D on this spinner?

A) 6:1
B) 8:1
C) 7:1
D) 1:7

55) If 5 apples in a barrel of 25 apples are rotten, what is the expected number of rotten apples in a 55) _____
random sample of 2 apples?

A) 1
B) $\dfrac{3}{5}$
C) $\dfrac{2}{5}$
D) $\dfrac{4}{5}$

56) A number cube labeled with numbers 1, 2, 3, 4, 5, and 6 is tossed. What are the odds in favor of the 56) _____
cube showing a number less than 3?

A) 1:1
B) 2:1
C) 1:3
D) 1:2

Find the probability.

57) What is the probability that 13 rolls of a fair die will show three sixes?　　　　57) _____

A) 0.0428　　　　B) 0.1069　　　　C) 0.4276　　　　D) 0.2138

Decide whether or not the events are mutually exclusive.

58) Being a teenager and being a United States Senator　　　　58) _____

A) No　　　　　　　　　　　　B) Yes

Solve the problem.

59) Mendel found no dominance in snapdragons with respect to red and white flower color. When　　59) _____
pure red (RR) and pure white (rr) parents are crossed, the resulting Rr combination (one of each
gene) produces second generation offspring with pink flowers. Suppose one of these second
generation pinks is crossed with a pure white. What is the probability that the resulting
snapdragon will have white flowers?

A) 0　　　　B) 0.75　　　　C) 0.25　　　　D) 0.5

Find the probability.

60) A family has five children. The probability of having a girl is 1/2. What is the probability of having　　60) _____
no girls?

A) $\dfrac{1}{32}$　　　　B) $\dfrac{1}{8}$　　　　C) $\dfrac{1}{64}$　　　　D) $\dfrac{1}{16}$

61) What is the probability that 18 tosses of a fair coin will show 5 tails?　　　　61) _____

A) 0.0327　　　　B) 0.0065　　　　C) 0.0164　　　　D) 0.0654

Find the indicated probability.

62) The manager of a bank recorded the amount of time each customer spent waiting in line during　　62) _____
peak business hours one Monday. The frequency table below summarizes the results.

Waiting Time (minutes)	Number of Customers
0-3	11
4-7	9
8-11	14
12-15	4
16-19	4
20-23	1
24-27	2

If one of these customers is selected at random, what is the probability that their waiting time is at
least 12 minutes or between 8 and 15 minutes?

A) 0.783　　　　B) 0.644　　　　C) 0.089　　　　D) 0.556

Use the general multiplication rule to find the indicated probability.

63) A sample of 4 different calculators is randomly selected from a group containing 45 that are defective and 25 that have no defects. What is the probability that all four of the calculators selected are defective?

    A) 0.1708   B) 0.0953   C) 0.1625   D) 11.7783

63) _____

Find the probability.

64) In one town, 68% of adults have health insurance. What is the probability that 6 adults selected at random from the town all have health insurance?

    A) 0.68   B) 0.088   C) 4.08   D) 0.099

64) _____

Give the probability that the spinner shown would land on the indicated color.

65) grey

    A) 3   B) $\dfrac{1}{2}$ C) $\dfrac{1}{3}$ D) $\dfrac{3}{4}$

65) _____
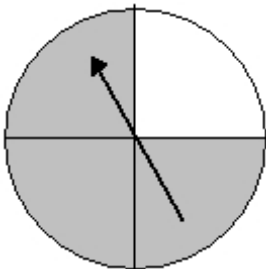
Find the expected value of the random variable.

66) The random variable X is the number of siblings of a student selected at random from a particular secondary school. Its probability distribution is given in the table.

x	0	1	2	3	4	5
P(X = x)	$\dfrac{7}{24}$	$\dfrac{13}{48}$	$\dfrac{3}{16}$	$\dfrac{7}{48}$	$\dfrac{1}{16}$	$\dfrac{1}{24}$

    A) 1.542   B) 1.438   C) 1.833   D) 2.5

66) _____

Use counting rules to determine the probability.

67) An elevator has 4 passengers and 8 floors. Find the probability that no 2 passengers get off on the same floor considering that it is equally likely that a person will get off at any floor.

    A) 0.910   B) 0.500   C) 0.410   D) 0.610

67) _____

Find the indicated probability.

68) A fair die is rolled. Find the probability that the number obtained is not greater than 4.

    A) $\dfrac{1}{2}$ B) $\dfrac{2}{3}$ C) $\dfrac{1}{3}$ D) $\dfrac{5}{6}$

68) _____

Solve the problem.

69) In a poll, respondents were asked whether they had ever been in a car accident. 145 respondents indicated that they had been in a car accident and 212 respondents said that they had not been in a car accident. If one of these respondents is randomly selected, what is the probability of getting someone who has been in a car accident?

    A) 0.007   B) 0.406   C) 0.594   D) 0.684

69) _____

Find the probability.

70) If a fair coin is tossed three times, find the probability of getting heads on the first toss and tails on the second and third tosses.

    A) $\frac{1}{6}$ B) $\frac{1}{8}$ C) $\frac{3}{8}$ D) $\frac{1}{4}$

70) _____

Find the indicated probability.

71) The age distribution of students at a community college is given below.

Age (years)	Number of students (f)
Under 21	401
21-25	400
26-30	213
31-35	55
Over 35	24
	1093

A student from the community college is selected at random. Find the probability that the student is between 26 and 35 inclusive. Round approximations to three decimal places.

    A) 0.050   B) 0.195   C) 268   D) 0.245

71) _____

Find the probability.

72) The participants in a television quiz show are picked from a large pool of applicants with approximately equal numbers of men and women. Among the last 12 participants there have been only 2 women. If participants are picked randomly, what is the probability of getting 2 or fewer women when 12 people are picked?

    A) 0.0161   B) 0.0193   C) 0.0190   D) 0.0032

72) _____

Find the indicated probability.

73) A card is drawn at random from a standard 52-card deck. Find the probability that the card is an ace or not a club.

    A) $\frac{10}{13}$ B) $\frac{43}{52}$ C) $\frac{35}{52}$ D) $\frac{9}{13}$

73) _____

Use counting rules to determine the probability.

74) A committee of 9 members is voting on a proposal. Each member casts a yea or nay vote. On a random voting basis, what is the probability that the proposal wins by a vote of 7 to 2?

    A) $\frac{9}{64}$ B) $\frac{9}{256}$ C) $\frac{9}{128}$ D) $\frac{7}{256}$

74) _____

Find the indicated probability.

75) A bag contains 5 red marbles, 4 blue marbles, and 1 green marble. If a marble is selected at random, what is the probability that it is not blue?

A) $\frac{3}{5}$
B) 6
C) $\frac{2}{5}$
D) $\frac{5}{3}$

75) _____

Find the probability.

76) A family has five children. The probability of having a girl is 1/2. What is the probability of having at least 3 boys?

A) 0.4688
B) 0.3125
C) 0.1563
D) 0.5000

76) _____

Find the conditional probability.

77) If two cards are drawn at random without replacement from a standard deck, find the probability that the second card is a spade, given that the first card was a spade.

A) $\frac{11}{51}$
B) $\frac{4}{17}$
C) $\frac{1}{4}$
D) $\frac{3}{13}$

77) _____

Determine whether the events are independent.

78) A bag contains 7 red and 11 green marbles. Two marbles are drawn without replacement. Are the events "first marble is red" and "second marble is green" independent events?

A) Yes
B) No

78) _____

Solve the problem.

79) A certain game involves tossing 3 fair coins. It pays 22 cents for 3 heads, 15 cents for 2 heads, and 7 cents for 1 head. What is a fair price to pay to play this game?

A) 11 cents
B) 9 cents
C) 8 cents
D) 15 cents

79) _____

Determine whether the events are independent.

80) A card is selected at random from a standard deck of 52 cards. It is then replaced and a second card is selected at random. Are the events "club on the first draw" and "ace on the second draw" independent?

A) No
B) Yes

80) _____

Solve the problem.

81) A commercial building contractor is trying to decide which of two projects to commit her company to.
Project A will yield a profit of $50,000 with a probability of 0.6, a profit of $82,000 with a probability of 0.3, and a profit of $10,000 with a probability of 0.1.
Project B will yield a profit of $100,000 with a probability of 0.1, a profit of $68,000 with a probability of 0.7, and a loss of $20,000 with a probability of 0.2.
Find the expected profit for each project. Based on expected values, which project should the contractor choose?

81) _____

A) Project A:$55,600
Project B: $53,600
Contractor should choose project A

B) Project A: $47,333
Project B: $49,333
Contractor should choose project A

C) Project A: $55,600
Project B: $61,600
Contractor should choose project B

D) Project A: $46,600
Project B: $53,600
Contractor should choose project B

Find the probability.

82) In a certain college, 33% of the physics majors belong to ethnic minorities. Find the probability that, from a random sample of 10 physics majors, no more than 6 belong to an ethnic minority.

82) _____

A) 0.9815   B) 0.913   C) 0.0547   D) 0.9846

Solve the problem.

83) Four married couples have reserved eight seats in a row at the theater, starting at an aisle seat. If they arrange themselves randomly, what is the probability that all the women will sit in adjacent seats and all the men will sit in adjacent seats?

83) _____

A) $\dfrac{1}{35}$ B) $\dfrac{1}{70}$ C) $\dfrac{2}{315}$ D) $\dfrac{1}{840}$

84) Mendel found that flower color in certain pea plants obeyed this scheme:
Pure red crossed with pure white produces red.
When pure red (RR) and pure white (rr) parents are crossed, the resulting Rr combination (one of each gene) produces second generation offspring with red flowers, since red is dominant. Suppose that two of these second generation Rr flowers are crossed. What is the probability that the resulting plant will have red flowers?

84) _____

A) 0.5   B) 1   C) 0.75   D) 0.25

Find the indicated probability.

85) Two fair dice are rolled. Find the probability that the sum of the two numbers is not greater than 5.

85) _____

A) $\dfrac{1}{6}$ B) $\dfrac{5}{18}$ C) $\dfrac{1}{3}$ D) $\dfrac{13}{18}$

Solve the problem.

86) 30% of the population of a village has a certain disease. If people in the village are selected successively at random, what is the probability that the 3th person selected is the first person with the disease?

86) _____

A) 0.090000   B) 0.147000   C) 0.063000   D) 0.490000

Find the probability.

87) If you are dealt two cards successively (with replacement of the first) from a standard 52-card deck, find the probability of getting a heart on the first card and a diamond on the second.

87) _____

A) $\frac{1}{16}$
B) $\frac{13}{204}$
C) $\frac{1}{169}$
D) $\frac{1}{204}$

88) A family has five children. The probability of having a girl is 1/2. What is the probability of having exactly 2 girls and 3 boys?

88) _____

A) $\frac{5}{16}$
B) $\frac{3}{32}$
C) $\frac{3}{8}$
D) $\frac{5}{32}$

Find the indicated probability.

89) The probability that Luis will pass his statistics test is 0.55. Find the probability that he will fail his statistics test.

89) _____

A) 1.82
B) 0.28
C) 0.45
D) 1.22

Use the general multiplication rule to find the indicated probability.

90) You are dealt two cards successively (without replacement) from a shuffled deck of 52 playing cards. Find the probability that both cards are black.

90) _____

A) $\frac{25}{51}$
B) $\frac{25}{102}$
C) $\frac{1}{2652}$
D) $\frac{13}{51}$

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.

91) In poker, a straight flush (5 in a row in a single suit)

91) _____

A) 0.00000231
B) 0.0000139
C) 0.00000923
D) 0.0000123

Find the probability.

92) A fair die is rolled 6 times. What is the probability of no more than three twos?

92) _____

A) 0.9913
B) 0.3812
C) 0.6774
D) 0.9649

Find the indicated probability.

93) If a person is randomly selected, find the probability that his or her birthday is not in May. Ignore leap years.

93) _____

A) $\frac{31}{365}$
B) $\frac{334}{365}$
C) $\frac{31}{334}$
D) $\frac{11}{12}$

Solve the problem.

94) If 3 balls are drawn at random from a bag containing 3 red and 4 blue balls, what is the expected number of red balls in the sample?

94) _____

A) 0.89
B) 1.39
C) 1.54
D) 1.29

95)

| 1 | 2 | 3 | 4 | 5 |

What are the odds against drawing a number greater than 2 from these cards?

A) 5:2   B) 2:5   C) 3:2   D) 2:3

95) _____

96) Henry is a quality control inspector. He is watching the production line for Barb's Raisin Cookie. Henry will reject a cookie with less than 8 raisins. In the past, one out of every 100 cookies had less than 8 raisins. Find the probability that the first cookie Henry rejects is the 5th cookie on the line.

A) 0.009606   B) 0.048030   C) 0.076848   D) 0.009510

96) _____

Find the indicated probability.

97) A sample of 4 different calculators is randomly selected from a group containing 14 that are defective and 34 that have no defects. What is the probability that at least one of the 4 calculators in the sample is defective?

A) 0.238   B) 0.762   C) 0.748   D) 0.140

97) _____

Decide whether or not the events are mutually exclusive.

98) Being over 30 and being in college

A) No   B) Yes

98) _____

Find the conditional probability.

99) Suppose one card is selected at random from an ordinary deck of 52 playing cards. Let

A = event a diamond is selected
B = event a club is selected.

Determine P (A | (not B)).

A) 1   B) $\frac{1}{3}$ C) 0   D) $\frac{1}{4}$

99) _____

Find the expected value of the random variable.

100) The random variable X is the number of offspring per year for a certain animal species. Find the expected number of offspring per year.

X (Number of Offspring)	0	1	2	3	4
Probability (X = x)	0.31	0.21	0.19	0.17	0.12

A) 1.58   B) 1.38   C) 1.75   D) 2

100) _____