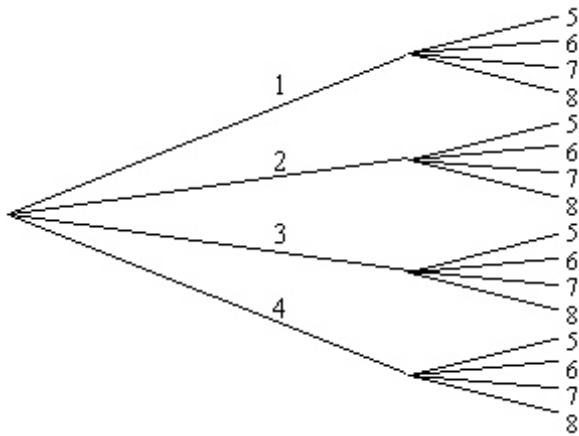1) A section of an exam contains two multiple-choice questions, each with three answer   1) _____
   choices (listed "A", "B", and "C"). List all the outcomes of the sample space.
      A) {A, B, C}
      B) {AA, AB, AC, BB, BC, CC}
      C) {AB, AC, BA, BC, CA, CB}
      D) {AA, AB, AC, BA, BB, BC, CA, CB, CC}

2) Box A contains the numbers 1, 2, 3, and 4. Box B contains the numbers 5, 6, 7, and 8. A   2) _____
   number is first drawn from Box A and then another number from Box B. Using the
   figure below, how many outcomes are possible if both numbers are even?

   A) 4   B) 16   C) 6   D) 8

3) If two dice are rolled one time, find the probability of getting a sum less than 5.   3) _____
      A) $\dfrac{1}{3}$ B) $\dfrac{5}{36}$ C) $\dfrac{1}{6}$ D) $\dfrac{7}{36}$

4) According to a survey, 31% of teenagers could recognize a picture of legendary film star   4) _____
   John Wayne. What is the probability that a randomly-selected teenager could recognize
   John Wayne?
      A) 0.31   B) 0.45   C) 0.69   D) 0.01

5) A section of an exam contains two multiple-choice questions, each with three answer   5) _____
   choices (listed "A", "B", and "C"). Assuming the outcomes to be equally likely, find the
   probability (as a reduced fraction) that both answers are the same ("AA", "BB" or "CC").
   [Hint: List all the outcomes of the sample space first.]
      A) 1/9   B) 1/3   C) 1/27   D) 1/6

6) The staff at a small company includes: 4 secretaries, 20 technicians, 4 engineers, 2 executives, and 50 factory workers. If a person is selected at random, what is the probability that he or she is a factory worker?

A) $\frac{2}{5}$ B) $\frac{1}{4}$ C) $\frac{1}{8}$ D) $\frac{5}{8}$

6) _____

7) At a certain college, there were 300 science majors, 300 engineering majors, and 400 business majors. If one student was selected at random, the probability that the student is an engineering major is _____.

A) $\frac{1}{3}$ B) $\frac{7}{10}$ C) $\frac{3}{10}$ D) $\frac{3}{7}$

7) _____

8) A couple has four children. Find the probability that all of them are girls.

A) $\frac{1}{2}$ B) $\frac{1}{8}$ C) $\frac{1}{4}$ D) $\frac{1}{16}$

8) _____

9) A couple has four children. Find the probability that there are exactly two boys and two girls.

A) $\frac{1}{8}$ B) $\frac{1}{16}$ C) $\frac{3}{8}$ D) $\frac{5}{8}$

9) _____

10) A couple has four children. Find the probability that there is at least one girl.

A) $\frac{11}{16}$ B) $\frac{5}{16}$ C) $\frac{1}{16}$ D) $\frac{15}{16}$

10) _____

11) Out of 914 items checked out of a public library, 400 were fiction books, 283 were non-fiction books, and 231 were videos (of any genre). What is the probability that a randomly-selected item was not a video?

A) 0.338   B) 0.438   C) 0.747   D) 0.253

11) _____

12) Human blood is grouped into four types. The percentages of Americans with each type are listed below.

O: 43%   A: 40%   B: 12%   AB: 5%

Choose one American at random. Find the probability that this person does not have type O blood.

A) 0.57   B) 0.67   C) 0.43   D) 0.47

12) _____

13) On a recent Saturday, a total of 1071 people visited a local library. Of these people, 245   13) _____
were under age 10, 496 were aged 10–18, 179 were aged 19–30, and the rest were more
than 30 years old.

One person is sampled at random. What is the probability that the person is less than 19
years old?
   A) 0.463   B) 0.741   C) 0.229   D) 0.692

14) If $P(A) = 0.22$, $P(B) = 0.55$, and A and B are mutually exclusive, find $P(A \text{ or } B)$.   14) _____
   A) 0   B) 0.77   C) 0.385   D) 0.33

15) If one card is drawn from an ordinary deck of cards, what is the probability that the card   15) _____
will be an ace, a king of hearts, or a spade?
   A) $\dfrac{11}{26}$ B) $\dfrac{19}{52}$ C) $\dfrac{9}{26}$ D) $\dfrac{17}{52}$

16) For a recent year the population for a group of Midwestern states in millions was   16) _____
distributed as follows:

Age group	Number
Under 5 years old	4.8
5-17 years	12.1
18-24 years	5.6
25-44 years	19.2
45-64 years	14.5
65+ years	8.5

If a person is selected at random from a Midwestern state, find the probability
that the person is
a. Either 5–17 years old or 25–44 years old.
b. Either 5–24 years old or 45–64 years old.
c. Either under 5 years old or over 64 years old.

17) In a recent study, the following responses were obtained to the question, "Do you favor recycling in your neighborhood?"

	Yes	No	No Opinion
Males	25	15	10
Females	30	10	10

If a response is picked at random, what is the probability that it came from a male or that it indicated no opinion regarding recycling?

A) $\frac{4}{5}$ B) $\frac{7}{10}$ C) $\frac{3}{10}$ D) $\frac{3}{5}$

18) A recent poll found that 30% of those surveyed are worried about aggressive drivers on the road. If three people are selected at random, what is the probability that all three will be worried about aggressive drivers on the road?

A) 0.027   B) 0.300   C) 0.900   D) 0.081

19) A lot of 1000 components contains 200 that are defective. Two components are drawn at random and tested. Let A be the event that the first component drawn is defective, and let B be the event that the second component drawn is defective.
Find $P(A$ and $B)$.

A) 0.005   B) 0.0398   C) 0.1992   D) 0.2

20) In a second grade class containing 14 girls and 10 boys, 2 students are selected at random to give out the math papers. What is the probability that both are girls?

A) $\frac{5}{12} \cdot \frac{9}{23}$ B) $\frac{7}{12} \cdot \frac{7}{12}$ C) $\frac{7}{12} \cdot \frac{14}{23}$ D) $\frac{7}{12} \cdot \frac{13}{23}$

21) An unfair coin has a probability 0.4 of landing heads. The coin is tossed four times. What is the probability that it lands heads at least once?

A) 0.8704   B) 0.9744   C) 0.25   D) 0.936

22) It has been reported that 3% of all cars on the highway are traveling at speeds in excess of 70 mph. If the speeds of four random automobiles are measured via radar, what is the probability that at least one car is going over 70 mph?

A) 0.00000081   B) 0.12   C) 0.89   D) 0.11

23) Below are listed the numbers of engineers in various fields by sex. Choose one engineer at random. Find P(electrical|male).

	Mechanical	Electrical	Biomedical
Male	8750	4167	6329
Female	3270	1183	5923

A) 0.779   B) 0.114   C) 0.217   D) 0.141

24) A store manager wants to display 5 different brands of toothpaste in a row. How many   24) _____
ways can this be done?
    A) 120   B) 20   C) 24   D) 5

25) There are _____ possible ways that eight pictures can be hung along a wall.   25) _____
    A) 1   B) 8   C) 5,040   D) 40,320

26) There are 2,368 possible ways that a committee of eight people can be selected from a   26) _____
group of 14 people.
    A) False   B) True

27) A committee consist of 7 women and 10 men. Three members are chosen as officers.   27) _____
What is the probability that all three officers are women?
    A) 0.0515   B) 0.1765   C) 0.01163   D) 0.0698

28) In a company there are 8 executives: 6 women and 2 men. 2 are selected to attend a   28) _____
management seminar. Find the probability that 1 men and 1 woman will be selected.
    A) ≈ 0.2500 B) 0.4286   C) ≈ 0.0833 D) ≈ 0.0400

29) A certain system has two components. There are 6 different models of the first   29) _____
component and 10 different models of the second. A salesman must select 2 of the first
component and 3 of the second to take on a sales call. How many different sets of
components can the salesman take?
    A) 2700   B) 1800

1) D
2) A
3) C
4) A
5) B
6) D
7) C
8) D
9) C
10) D
11) C
12) A
13) D
14) B
15) D
16) a. 0.484

   b. 0.498

   c. 0.206
17) D
18) A
19) B
20) D
21) A
22) D
23) C
24) A
25) D
26) A
27) A
28) B
29) B