Exercise 24

How many sequences of 3 zeroes and 11 ones are possible?

Exercise 25

List the elements of each of the following sample spaces:

a) The set of integers between 1 and 50 divisible by 8.

b) the set S = $\{x|x^2 + 4x - 5 = 0\}$

c) the set S = $\{x|x$ is a continent$\}$

Exercise 26

Describe the sample space S consisting of all points in the first quadrant inside a circle of radius 3 with center at the origin.

Exercise 27

An experiment involves tossing a pair of dice, one green and one red, and recording the numbers that come up. If x equals the outcome on the green die and y the outcome on the red die, describe the sample space S.

a) In terms of elements using the notation (x, y)

b) list the elements corresponding to the event A that the sum is greater than 8.

c) list the elements corresponding to the event B that a 2 occurs on either die.

d) list the elements corresponding to the event C that a number greater than 4 occurs on the green die.

e) list the elements corresponding to the event $A \cap C$

f) list the elements corresponding to the event $A \cap B$

g) list the elements corresponding to the event $B \cap C$

Exercise 28

Two jurors are selected from 4 alternates to serve at a murder trial. Using the notation $A_1\, A_3$ for example, to denote the simple event that alternates 1 and 3 are selected, list the 6 elements of the sample space S.

Exercise 29

Consider the sample space S = { copper, sodium, nitrogen, potassium, uranium, oxygen, zinc } and the events

A = { copper, sodium, zinc }
B = { sodium, nitrogen, potassium }
C = { oxygen }

List the elements of the sets corresponding to the following events:

a) A'

b) $A \cup C$

c) $(A \cap B') \cup C'$

d) $B' \cap C'$

e) $A \cap B \cap C$

f) $(A' \cup B') \cap (A' \cap C)$

Exercise 30

If S = $\{x|0 < x < 12\ , x \in \mathbb{R}\}$, M = $\{x|1 < x < 9, x \in \mathbb{R}\}$ and N = $\{x|0 < x < 5, x \in \mathbb{R}\}$, find

a) $M \cup N$

b) $M \cap N$

c) $M' \cap N'$

Exercise 31

If each coded item in a catalog begins with 3 distinct letters followed by 4 distinct nonzero digits, find the probability of randomly selecting one of these coded items with the first letter a vowel and the last digit being even.

Exercise 32

An automobile manufacturer is concerned about a possible recall of its best-selling four-door sedan. If there were a recall, there is a probability of 0.25 of a defect in the brake system, 0.18 of a defect in the transmission, 0.17 of a defect in the fuel system, and 0.40 of a defect in some other area.

a) What is the probability that the defect is the brakes or the fueling system if the probability of defects in both systems simultaneously is 0.15?

b) What is the probability that there are no defects in either the brakes or the fueling system?

Exercise 33

If a letter is chosen at random from the English alphabet, find the probability that the letter

a) is a vowel exclusive of y

b) is listed somewhere ahead of the letter j

c) is listed somewhere after the letter g

Exercise 34

A pair of fair dice is tossed. Find the probability of getting

a) a total of 8

b) at most a total of 5

Exercise 35

In a poker hand consisting of 5 cards, find the probability of holding

a) 3 aces

b) 4 hearts and 1 club.

Exercise 36

If three books are picked at random from a shelf containing 5 novels, 3 books of poems, and a dictionary, what is the probability that

a) the dictionary is selected?

b) 2 novels and 1 book of poems are selected?

Exercise 37

In a high school graduating class of 100 students, 54 students studied mathematics, 69 students studied history, and 35 studied both mathematics and history. If one of these students is selected at random, find the probability that

a) the student took mathematics or history?

b) the student did not take either of these subjects?

c) the student took history but not mathematics?