

7.

The table alongside gives the age distribution of prison inmates as of December 31, 2007. A prisoner was released on January 1, 2008. Find the probability that:

- a the prisoner was male
- b the prisoner was aged between 17 and 19
- c the prisoner was 19 or under given that the prisoner was female
- d the prisoner was 19 or under given that the prisoner was male
- e the prisoner was female given that the prisoner was aged 60+.

Age distribution of prison inmates			
Age	Female	Male	Total
15	0	6	6
16	5	23	28
17 - 19	26	422	448
20 - 24	41	1124	1165
25 - 29	36	1001	1037
30 - 34	32	751	783
35 - 39	31	520	551
40 - 49	24	593	617
50 - 59	16	234	250
60+	5	148	153
Total	216	4822	5038

8.

A fair die is rolled. Determine the probability of getting:

- a a 3 or a 5
- b a negative integer
- c a 9
- d a result less than 4
- e a non-five.



9.

A bag contains 4 red and 3 green buttons. One button is randomly selected from the bag. Determine the probability of getting:

- a a red
- b a green
- c a red or a green
- d a red and a green.

10.



A 52 card pack is well shuffled, and then one card is dealt from the top of the pack. Determine the probability that it is:

- a a Jack
- b a non-Jack
- c a black card
- d a diamond
- e a diamond and an ace
- f a diamond or an ace.

11

A lottery consists of 80 tickets numbered 1 to 80. One ticket is chosen at random. Determine the probability that the ticket is:

- a a single digit number
- b a multiple of 8
- c a multiple of 5 or 8
- d a factor of 36.

12.

A coin and a die are tossed simultaneously. Draw a 2-dimensional grid to illustrate the sample space. Determine the probability of getting:

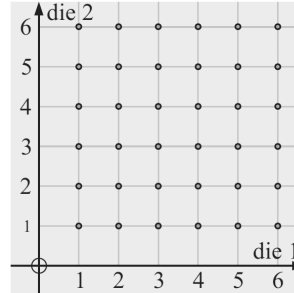
- a a tail and a 6
- b a tail or a 6
- c neither a 2 nor a 6
- d neither a tail nor a 5
- e a head and an odd number
- f a head or an odd number.

13.

A pair of dice is rolled. The 36 different possible 'pair of dice' results are illustrated on the 2-dimensional grid alongside.

Use the grid to determine the probability of getting:

- a two 3s
- b a 5 and a 6
- c a 5 or a 6
- d at least one 6
- e exactly one 6
- f no sixes
- g a sum of 7
- h a sum of 7 or 11
- i a sum greater than 8
- j a sum of no more than 8.



14.

A school has two photocopiers. On any one day, machine A has an 8% chance of malfunctioning and machine B has a 12% chance of malfunctioning.

Determine the probability that on any one day both machines will:

- a malfunction
- b work effectively.

15.

A coin is tossed 3 times. Determine the probability of getting the following sequences of results:

- a head, then head, then head
- b tail, then head, then tail.

16.

Two marksmen fire at a target simultaneously. John hits the target 70% of the time and Benita hits it 80% of the time. Determine the probability that:

- a they both hit the target
- b they both miss the target
- c John hits it but Benita misses
- d Benita hits it but John misses.

17.

A couple decide that they want 4 children, none of whom will be adopted. They would really like the children to be born in the order boy, girl, boy, girl. Determine the probability that:

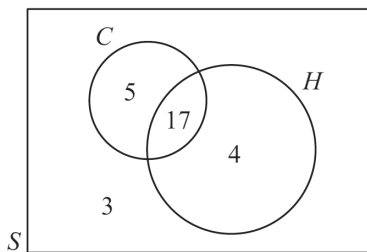
- a the children will be born in the desired order
- b the children will be born in some other order.

18.

An archer always hits a circular target with each arrow shot. On average he hits the bullseye 2 out of every 5 shots. If 3 arrows are shot at the target, determine the probability that the bullseye is hit:

- a every time
- b the first two times, but not on the third
- c on no occasion.

19.



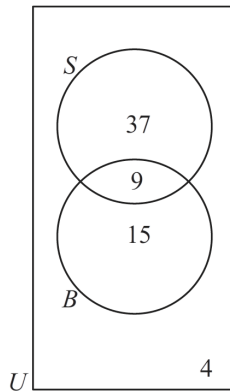
The Venn diagram alongside illustrates the number of students in a particular class who study Chemistry (C) and History (H). Determine the number of students:

- a in the class
- b who study both subjects
- c who study at least one of the subjects
- d who only study Chemistry.

20.

In a survey at an alpine resort, people were asked whether they liked skiing (S) or snowboarding (B). Use the Venn diagram to determine the number of people:

- a who took part in the survey
- b who liked both activities
- c who liked neither activity
- d who liked exactly one of the activities.



21.

50 married men were asked whether they gave their wife flowers or chocolates for their last birthday. The results were: 31 gave chocolates, 12 gave flowers, and 5 gave both chocolates and flowers. If one of the married men was chosen at random, determine the probability that he gave his wife:

- a chocolates or flowers
- b chocolates but not flowers
- c neither chocolates nor flowers.

22.

In a class of 40 students, 19 play tennis, 20 play netball, and 8 play neither of these sports. A student is randomly chosen from the class. Determine the probability that the student:

- a plays tennis
- b does not play netball
- c plays at least one of the two sports
- d plays one and only one of the sports
- e plays netball, but not tennis.

23.

The medical records for a class of 30 children show whether they had previously had measles or mumps. The records show that 24 have had measles, 12 have had measles and mumps, and 26 have had measles or mumps. If one child from the class is selected randomly from the group, determine the probability that he or she has had:

- a mumps
- b mumps but not measles
- c neither mumps nor measles.

24.

A football goalkeeper has probability $\frac{3}{10}$ of saving a penalty attempt. How many goals would he expect to save out of 90 penalty shots?

25.

During the snow season there is a $\frac{3}{7}$ probability of snow falling on any particular day. If Dan skis for five weeks, on how many days could he expect to see snow falling?

26.

A hat contains three yellow discs and four green discs. A disc is drawn from the hat. If the disc is then returned to the hat and the procedure is repeated 350 times, on how many occasions would you expect a green disc to be drawn?

27.

In a random survey of her electorate, politician A discovered the residents' voting intentions in relation to herself and her two opponents B and C. The results are indicated alongside:

A	B	C
165	87	48

- a Estimate the probability that a randomly chosen voter in the electorate will vote for:
 - i A
 - ii B
 - iii C.
- b If there are 7500 people in the electorate, how many of these would you expect to vote for:
 - i A
 - ii B
 - iii C?

28.

A person rolls a normal six-sided die and wins the number of dollars shown on the face.

- a How much would the person expect to win for one roll of the die?
- b If it costs \$4 to play the game, would you advise the person to play several games?

29.

A person plays a game with a pair of coins. If a double head appears, \$10 is won. If a head and a tail appear, \$3 is won. If a double tail appears, \$5 is lost.

- a How much would a person expect to win playing this game once?
- b If the organiser of the game is allowed to make an average of \$1 per game, how much should be charged to play the game once?

30.

A single coin is tossed once. If a head appears you win \$2 and if a tail appears you lose \$1. How much would you expect to win from playing this game three times?

31.

Jar X contains 3 white and 2 red marbles. Jar Y contains 6 white and 4 red marbles. A marble is selected at random from each jar. Determine the probability that:

- a both marbles are white
- b both marbles are red
- c one marble of each colour is selected.

32.

At a local girls' school, 65% of the students play netball, 60% play tennis, and 20% play neither sport. Display this information on a Venn diagram, and hence determine the likelihood that a randomly chosen student plays:

- a netball
- b netball but not tennis
- c at least one of these two sports
- d exactly one of these two sports.