Probability   ANSWERS

Example .

A die (dice) has the numbers   1 2 3 4 5 6 on it.
When it is thrown,
  (a) what is the probability of throwing an odd number ?
  (b) if the die is thrown 70 times, how many times would you
       expect an odd number ?

Answer :
  (a) There are 3 odd numbers out of 6   (1, 3 and 5)
           1   2 **3** 4 **5** 6
       So probability (odd number) = 3/6 = 1/2

         2   Expect 1/2 X 70 = 35

1   (a) what is the probability of throwing an even number ?   1/2
    (b) if the die is thrown 60 times, how many times would you
          expect an even number ?   30

2   (a) what is the probability of throwing a prime number ?   1/2
    (b) if the die is thrown 70 times, how many times would you
          expect a prime number ?   35

3   (a) what is the probability of throwing a number bigger than 5?   1/6
    (b) if the die is thrown 42 times, how many times would you
          expect a number bigger than 5?   7

4   (a) what is the probability of throwing a number less than 3?   1/3
    (b) if the die is thrown 90 times, how many times would you
          expect a number less than 3 ?   30

In these questions which follow, a 10 sided dice has the numbers
1 to 10 on the sides.

5   (a) what is the probability of throwing an odd number ?   1/2
    (b) if the die is thrown 20 times, how many times would you
          expect an odd number ?   10

6   (a) what is the probability of throwing a multiple of 3 ?   3/10
    (b) if the die is thrown 50 times, how many times would you
          expect a multiple of 3 ?   15

7   (a) what is the probability of throwing a number less than 5 ?   2/5
    (b) if the die is thrown 100 times, how many times would you
          expect a number less than 5 ?   40

8 (a) what is the probability of throwing a multiple of 5 ?   1/5
   (b) if the die is thrown 120 times, how many times would you
        expect a multiple of 5 ?   24

9 (a) what is the probability of throwing a square number ?   3/10
   (b) if the die is thrown 30 times, how many times would you
        expect a square number ?   9

10 (a) what is the probability of throwing a factor of 16 ?   2/5
   (b) if the die is thrown 3000 times, how many times would you
        expect an odd number ?   1200

In a pack of Playing cards there are 52 cards (+ 2 jokers ignore.)
There are 4 different suits :   2 RED   Diamonds and Hearts
                                 2 BLACK   Spades and Clubs
There are 13 cards in each suit
In each suit : ACE, 2, 3, 4, 5, 6, 7, 8, 9, 10,JACK, QUEEN, KING

A card is chosen at random. What is the probability of choosing

11 An Ace   1/13
12 A black Queen   1/26
13 A red card   1/2
14 A red or a black card   1/1
15 The 5 of Clubs   1/52
16 A Diamond or a Heart   1/2
17 Any King   1/13
18 A King or a Queen of a Jack   3/13
19 A BLUE suit   0
20 A card with the number 9   1/13

21 In a College class the colour of hair of the students is noted..

                    Brown   11
                    Black   9
                    Blonde   8
                    Brunette   2

    What is the probability that if s student was chosen at random they would
    have Blonde hair?   4/15
    Give your answer as a decimal correct to 2-decimal places.   0.27

22 The probability of a train arriving late is 1/5

    (a) What is the probability of it arriving on time ?   4/5
    (b) The train arrives at the station 20 times over the weekend
        How many times would you expect it to be on time ?   16

23 The ages of a group of builders were as follows:

| 36 | 19 | 33 | 25 | 37 | 33 | 21 | 34 |
| 34 | 47 | 33 | 18 | 34 | 32 | 34 | 35 |

What is the probability that a builder chosen at random will be
more than 25 years old?   3/4
Give your answer as a decimal fraction.   0.75

24 There are 5 white, 9 green and 7 red balls in a bag.

(a) If a ball is taken at random from the bag what is the probability
that the ball is white?   5/21
(b) The ball drawn was white and **is not replaced** in the bag.
A second ball is now taken from the bag.
What is the probability that this second bead is **not** white?   4/5
Give your answer as a fraction in its simplest form.   0.8

25 Amazon Books offers 3 kindle book Deals for £50 as shown below :

Deal 1 :	4 Horror, 5 Romance , 7 Suspense and 4 Comedy.
Deal 2 :	3 Thriller, 4 Biography, 5 Comedy and 8 Sci-Fi
Deal 3 :	2 Suspense, 4 Comedy, 6 Horror and 8 Biography.

(a) If Pauline chooses a Deal at random, what would be the probability of her
choosing a deal with 4 Comedy books ?   2/3

(b) What is the probability of choosing a Deal containing more Thriller books
than Biography books ?   0

26 A survey is taken of how 100 pupils travel to school.
The results are shown in the table.

(i) What is the probability that a pupil chosen at
random cycles to school ?   9/100

(ii) 4 pupils who normally travel by bus are transferred.
What is the probability that a pupil now chosen at
random goes by car to school ?   1/4

Transport	Number of pupils
Bus	36
Cycle	9
Walk.	31
Car	24

Example .

In a box there is a mixture of milk and plain chocolates.

There are 20 plain chocolates and the remainder are milk chocolates.

The probability that a chocolate chosen at random from the box is a milk one is $\frac{3}{8}$
How many chocolates, in total, are in the box?

Answer :

$\frac{3}{8}$ are milk
So $\frac{5}{8}$ are plain = 20 chocolates
So 1/8   = 20 ÷ 5 = 4
   8/8   =   4 X 8 =32
There are 32 chocolates in the box.

27. In a box there is a mixture of red and green counters.

   There are 40 red counters and the remainder are green counters.

   The probability that a counter chosen at random from the box is a green one is $\frac{3}{8}$
   How many counters, in total, are in the box?   64

28 On a bus there is a mixture of Scottish and English students..

   There are 55 Scottish students and the remainder are English students

.

   The probability that a student chosen at random is Scottish is $\frac{5}{6}$
   How many students, in total, are on the bus?   66

29 In a crate of fruit there is a mixture of apples and oranges.

   There are 45 apples and the remainder are oranges.

   The probability that an orange is chosen at random from the crate is is $\frac{2}{5}$
   How many pieces of fruit, in total, are in the box?   75

30 There is a mixture of magazines and comics on a library shelf..

   There are 36 comics and the remainder are magazines.

   The probability that a magazine is chosen at random from the shelf
   rather than a comic $\frac{5}{8}$
   What is the total number of magazines and comics on the shelf?   96

Example .

A charity lottery consists of a draw from a set of 40 balls
numbered from 1 to 40.

(a) What is the probability that the first ball drawn
   has a number greater than 30?

In the draw five numbered balls are drawn and not replaced.

(b) What is the probability of the number 7 being drawn as the fifth
   ball if it was not drawn in the first four?

Answer :

   (a) There are 10 balls greater than 30
      So probability is 10/40 = ¼

   (b) By the time you get to the fifth ball, 4 have already been removed.
      This leaves 36 balls.
      So the probability of choosing the number 7 as the fifth ball
      is   1/36

31.
A charity lottery consists of a draw from a set of 50 balls
numbered from 1 to 50.

(a) What is the probability that the first ball drawn
   has a number greater than 35?   3/10

In the draw five numbered balls are drawn and not replaced.

(b) What is the probability of the number 12 being drawn as the fifth
   ball if it was not drawn in the first four?   1/46

32
A charity lottery consists of a draw from a set of 60 balls
numbered from 1 to 60.

(a) What is the probability that the first ball drawn
   has a number less than 11?   1/6

In the draw three numbered balls are drawn and not replaced.

(b) What is the probability of the number 21 being drawn as the third
   ball if it was not drawn in the first two?   1/58

Mrs McLaughlin
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