Probability – 2023 O Level Math D 4024

1. Nov/2023/Paper_ 4024/21/No.8a(iv), b

(a) A group of 40 children are each asked how many books they read last month.
The table shows the results.

Number of books	0	1	2	3	4	5
Frequency	7	11	9	5	6	2

(iv) One of the 40 children is chosen at random.

Find the probability that this child read 4 or more books.
Give your answer as a fraction in its simplest form.

..... [2]

(b) There are 10 books on a shelf.
7 of the books are fiction and 3 are non-fiction.

(i) Sanjay takes a book from the shelf at random, looks at it and replaces it.
He then takes another book from the shelf at random, looks at it and replaces it.

Find the probability that one book is fiction and the other book is non-fiction.

..... [2]

(ii) Mona takes 3 books from the 10 books on the shelf at random without replacement.

Find the probability that only one of the books she takes is fiction.

..... [3]

2. Nov/2023/Paper_ 4024/22/No.5

(a) A bag contains 40 balls.
28 of the balls are red and the rest are green.
Aisha takes a ball from the bag at random, notes its colour and replaces it.

(i) Find the probability that this ball is green.

..... [1]

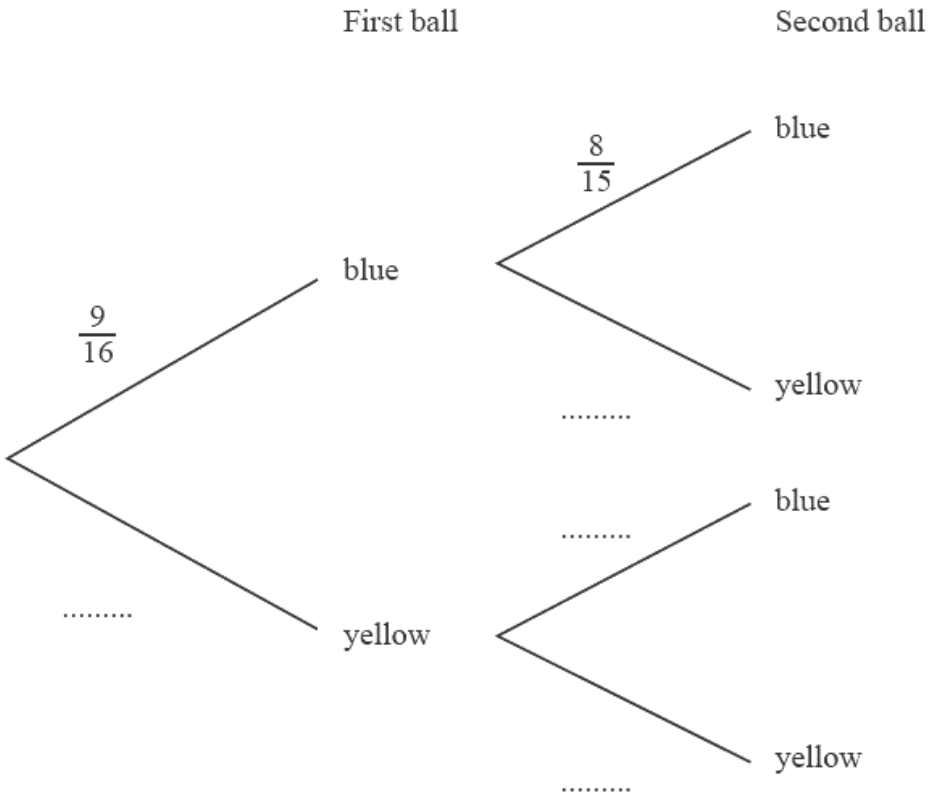
(ii) Aisha repeats this 200 times.

Work out the number of times she expects to take a green ball.

..... [1]

(b) A bag contains 9 blue balls and 7 yellow balls.
Sergio takes two balls from the bag at random without replacement.

(i) Complete the tree diagram.



[2]

(ii) Find the probability that the two balls are the same colour.

..... [2]

3. June/2023/Paper_ 4024/11/No.12

(a) Ali keeps a record of the computer games he plays.
Out of the first 6 games, Ali wins 4.
Out of the first 20 games, Ali wins 13.

Use these results to find the best estimate for the probability that Ali will **not** win the next computer game he plays.

..... [1]

(b) A spinner is spun n times.
The spinner lands on red 14 times.
The relative frequency of the spinner landing on red is 0.2 .

Find the value of n.

$n =$ ..... [2]

4. June/2023/Paper_ 4024/12/No.23

There are 10 cards in a set.
Each card shows either a square or a triangle.
Every shape on each card is either green or red.
The table shows the number of cards of each type.

	Green	Red
Square	3	1
Triangle	4	2

(a) Ken takes a card at random from the set, notes the colour and replaces it.
He then takes a second card at random from the set, notes the colour and replaces it.

Find the probability that both cards show a green shape.

..... [2]

(b) Irina takes two cards at random from the set of 10 without replacement.

Find the probability that both cards show the same shape.

..... [3]

5. June/2023/Paper_ 4024/21/No.10

Bags of sweets are packed into boxes.

(a) A box is opened and the number of sweets in each bag is counted.
The results are shown in the table.

Number of sweets	11	12	13	14	15
Frequency	15	26	38	p	9

(i) Explain why the total number of bags in the box cannot be 87.

.....

..... [1]

(ii) The mean number of sweets per bag in this box is 12.8 .

Find the value of p.

$p =$ ..... [3]

(b) Another box is opened and the number of sweets in each bag is counted.
The results are shown in the table.

Number of sweets	11	12	13	14	15
Frequency	12	28	39	r	9

A bag of sweets is chosen at random from this box and not replaced.
A second bag of sweets is then chosen at random from the same box.
The probability that both bags contain 15 sweets is $\frac{4}{539}$.

(i) Show that $r^2 + 175r - 2046 = 0$.

[3]

(ii) Solve $r^2 + 175r - 2046 = 0$ to find the value of r.
Show your working.

$r =$ ..... [3]