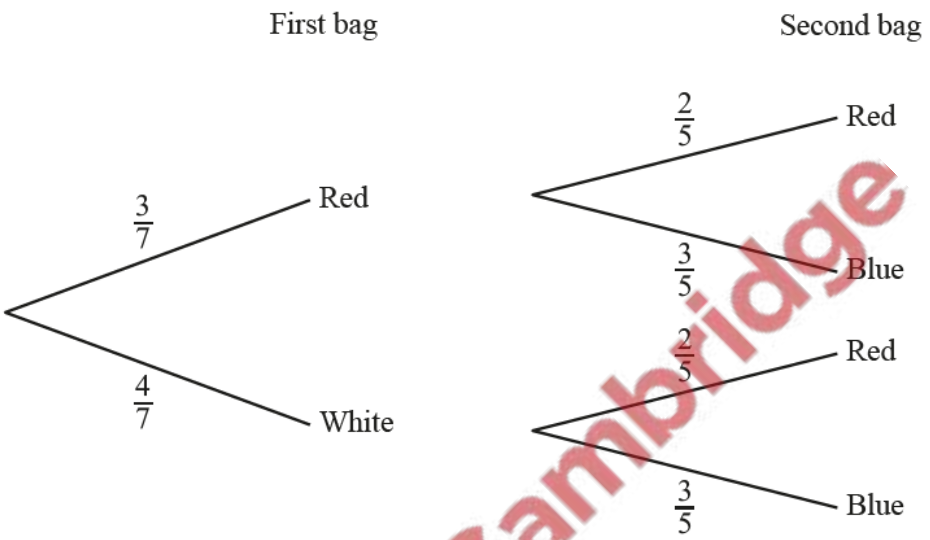
Probability – 2020 O Level Math D

1. Nov/2020/Paper_12/No.15

Two bags contain beads.

The first bag contains 7 beads, of which 3 are red and 4 are white.
The second bag contains 5 beads, of which 2 are red and 3 are blue.

One bead is taken, at random, from each bag.
The tree diagram is shown below.



Find the probability that

(a) both beads are red,

..... [1]

(b) both beads are white,

..... [1]

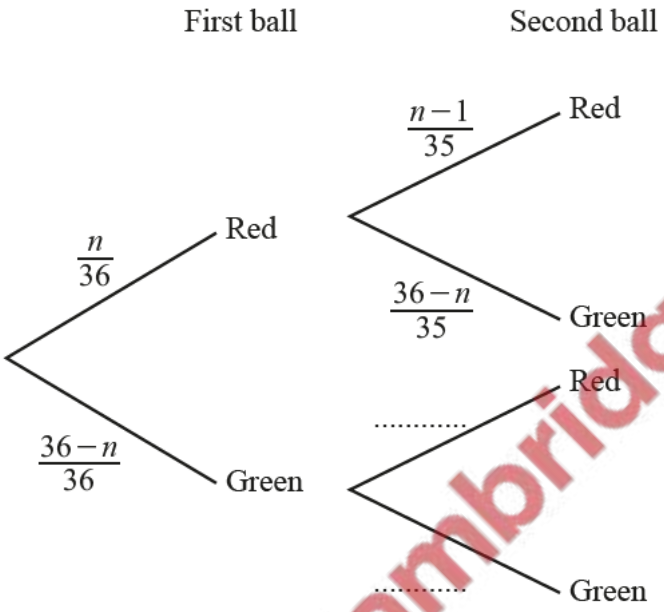
(c) **exactly** one bead is red.

..... [2]

2. Nov/2020/Paper_21/No.8

A bag contains 36 balls.
There are n red balls in the bag.
The rest of the balls are green.
Esther takes two balls from the bag, at random, without replacement.

(a) Complete the tree diagram.



[2]

(b) Write an expression, in terms of n, for the probability that Esther's first ball is red and her second ball is green.

..... [1]

(c) The probability that Esther's first ball is red and her second ball is green is $\frac{1}{7}$.

Show that $n^2 - 36n + 180 = 0$.

[2]

(d) Solve the equation $n^2 - 36n + 180 = 0$.
Show your working.

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

(e) There are more green balls than red balls in the bag.

Find the probability that Esther takes two green balls.
Give your answer as a fraction in its lowest terms.

..... [3]

3. June/2020/Paper_11/No.14

In a survey, some students were asked about their favourite type of music.
They could choose Classical, Folk, Reggae or Rock.
The following relative frequencies were calculated from the results.

Type of music	Classical	Folk	Reggae	Rock
Relative frequency	0.15	0.22		0.39

300 students took part in this survey.

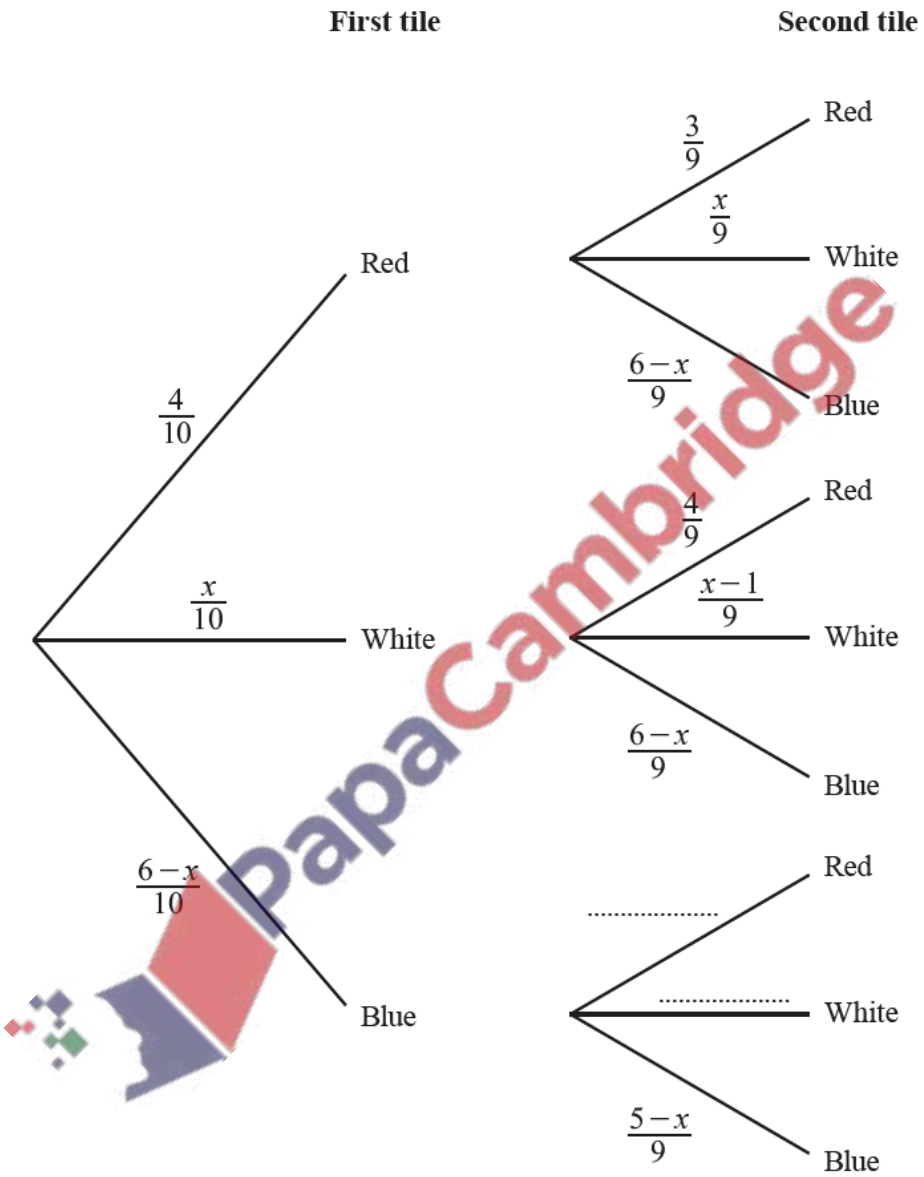
Calculate the number of students who chose Reggae.

..... [3]

4. June/2020/Paper_21/No.9

A bag contains 10 tiles.
There are 4 red tiles, x white tiles and the rest are blue.
Two tiles are taken at random, without replacement, from the bag.

(a) Complete the tree diagram.



[2]

(b) Calculate the probability that both the tiles are red.

..... [1]

(c) **(i)** Show that the probability that the tiles are both the same colour is $\frac{x^2-6x+21}{45}$.

[4]

(ii) The probability the tiles are both the same colour is $\frac{16}{45}$.

Show that $x^2-6x+5=0$.

[1]

(iii) Solve $x^2-6x+5=0$.

$x =$ ..... or $x =$ ..... [2]

(iv) There are more red tiles than white tiles in the bag.

Find the probability that the first tile taken from the bag is blue.

..... [2]

5. June/2020/Paper_22/No.6

(a)

5	2	4	6	3

Two of these cards are chosen at random.
They are placed next to each other to give a two-digit number.

(i) Find the probability that the two-digit number is less than 30.

..... [1]

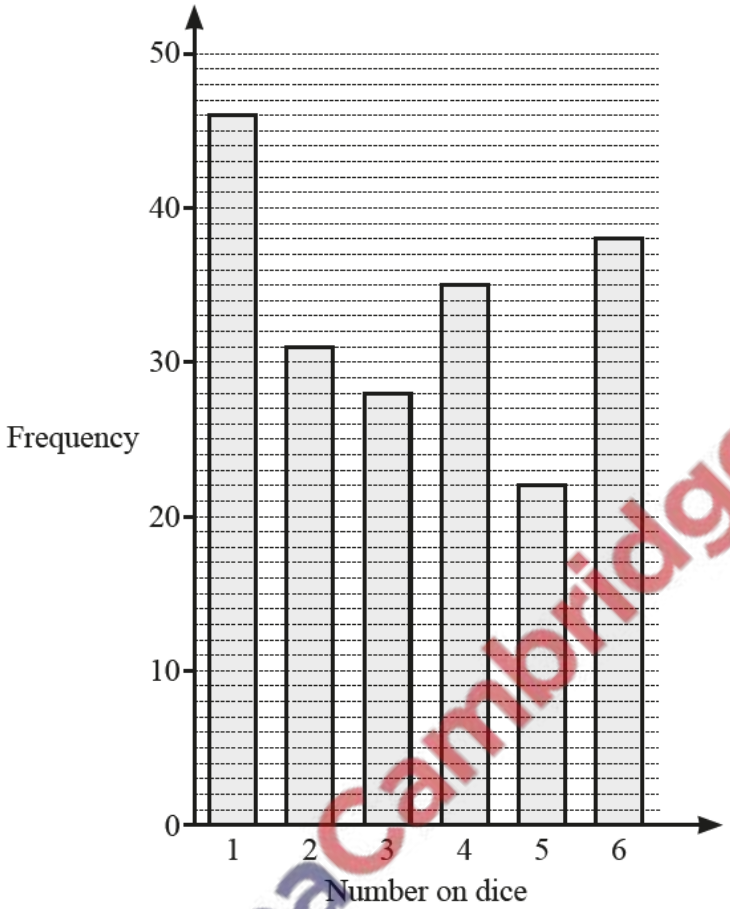
(ii) List all the possible two-digit numbers that are prime.

..... [2]

(iii) Find the probability that the two-digit number is a multiple of 4.

..... [2]

(b) Rowan throws a dice 200 times.
The bar chart shows his results.



(i) Use the bar chart to complete the table of results.

Number on dice	1	2	3	4	5	6
Frequency	46	31	28			

[1]

(ii) Using Rowan's results, find the relative frequency that he threw a number less than 3.

..... [2]

(iii) Rowan says that the dice he has thrown is not a fair dice.

Make two comments to explain why the dice may not be fair.

.....

..... [2]