Probability – 2021/20 GCSE Mathematics Higher

1. Nov/2021/Paper_J560/04/No.4

Li throws two fair four-sided dice, each numbered 1, 2, 3 and 4.
Li multiplies together the two numbers that the dice land on to produce a score.

Find the probability that Li's score is a prime number.

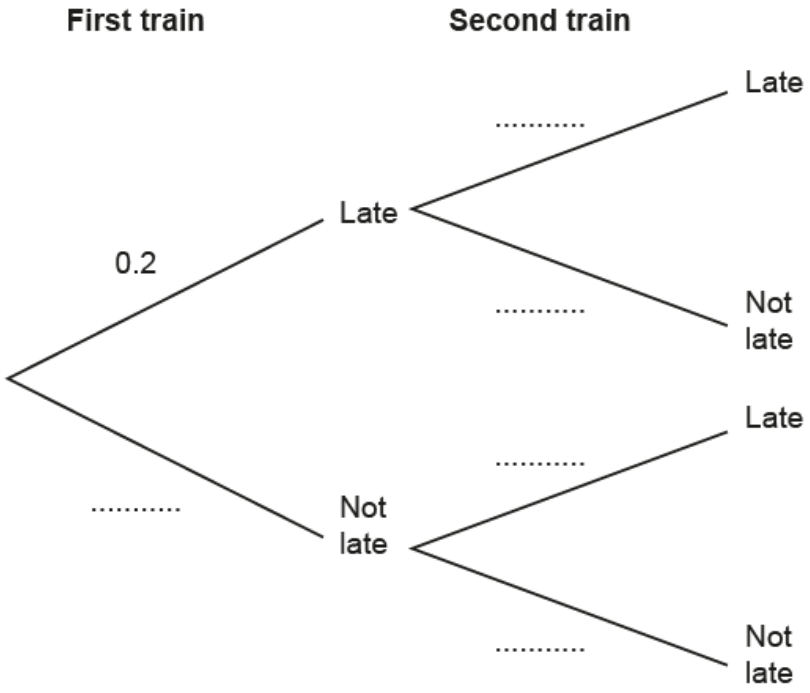
..... **[4]**

2. Nov/2021/Paper_J560/04/No.7

(a) Over a long period of time, it is found that the probability of a train from Bewford to London being late is 0.2.

(i) One morning there are two trains from Bewford to London.

Use the information to complete the tree diagram.



[2]

(ii) Work out the probability that both trains are **not late**.

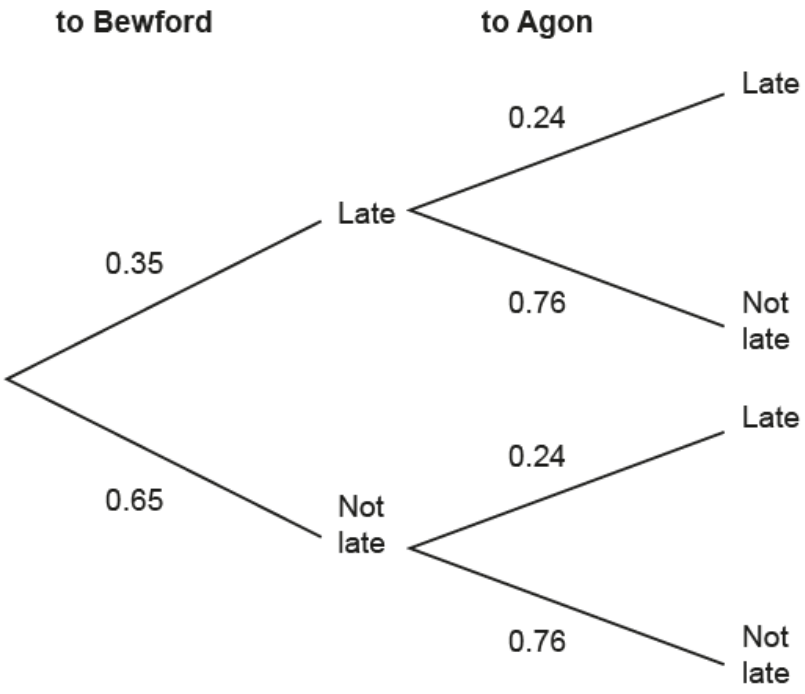
(a)(ii) ..... **[2]**

(iii) Give a reason why the probabilities used in the tree diagram for the second train may **not** be reliable.

.....

..... **[1]**

(b) Morgan takes a train from London to Bewford and then another train to Agon.
The tree diagram shows the probabilities of Morgan's trains being late or not late.



Morgan will **not catch** the train to Agon if the train to Bewford is late and the train to Agon is not late.

Work out the probability that Morgan will **catch** the train to Agon.

(b) ..... **[3]**

3. Nov/2021/Paper_J560/05/No.16

In a group of 60 students, 40 own a smartphone, 27 own a tablet and 8 own neither.

A student is chosen at random from those that own a tablet.

Find the probability that they also own a smartphone.
You must show your working.

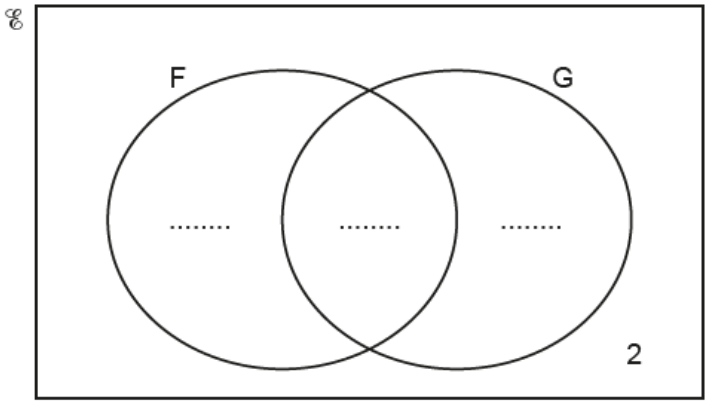
..... **[5]**

4. Nov/2021/Paper_J560/06/No.11

In a class of 30 students

- 17 study French (F)
- 20 study German (G)
- 2 do not study either subject.

(a) Complete the Venn diagram.



[3]

(b) Two of the 30 students are chosen at random.

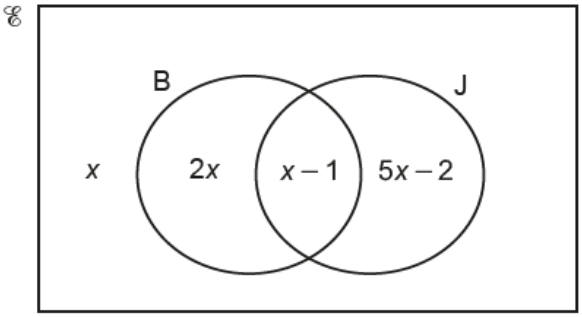
Calculate the probability that one of these two students studies French but not German and the other studies German but not French.
You must show your working.

(b) ..... **[5]**

5. Nov/2020/Paper_J560/04/No.4

In a survey, 60 students were asked whether they have a bank account (B) and whether they have a part-time job (J).

The number of students who had neither a bank account nor a part-time job was x.
The Venn diagram shows the results in terms of x.



One of the 60 students is chosen at random.

Find the probability that they have a bank account.
Show your working.

..... **[5]**

6. Nov/2020/Paper_J560/05/No.4

Dora has the following number cards.

She takes a card at random, replaces the card and then takes a second card.
She adds the numbers on the two cards she has taken and records the total.

(a) Complete the following table to show all of her possible totals.

		First card				
	Total	2	2	3	5	6
Second card	2	4	4	5	7	8
	2	4	4	5		8
	3	5	5		8	9
	5	7		8	10	11
	6	8	8	9	11	12

[1]

(b) Find the probability that her total is

(i) an even number,

(b)(i) ..... **[2]**

(ii) a multiple of 3 or 4.

(ii) ..... **[2]**

7. Nov/2020/Paper_J560/05/No.8

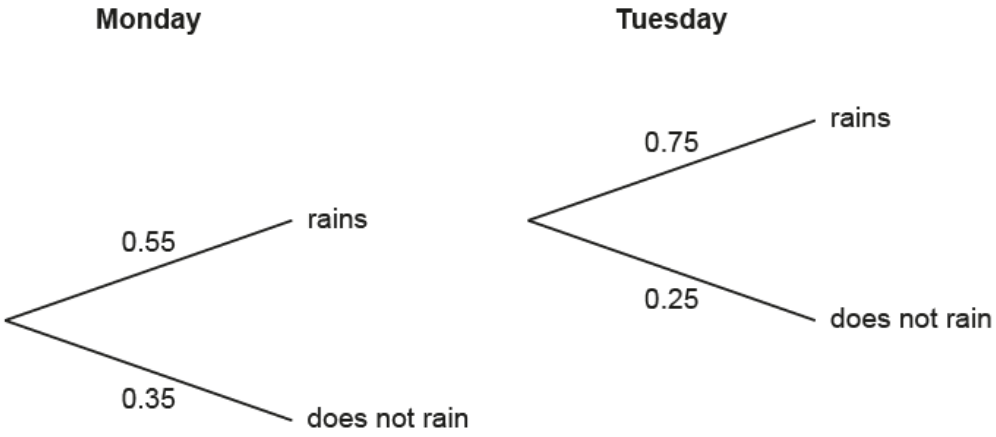
A weather forecast says

- the probability that it will rain on Monday is 0.55

and

- the probability that it will rain on Tuesday is 0.25.

Ella draws a tree diagram to show this information.



Write down three errors that Ella has made with her tree diagram.

1 .....

.....

2 .....

.....

3 .....

..... **[3]**

8. Nov/2020/Paper_J560/06/No.8

Li has t toy bricks.
She only has red bricks and blue bricks.

Li picks two bricks, one after the other.

If the first brick she picks is red, the probability that the second brick is red is $\frac{2}{3}$.

If the first brick she picks is blue, the probability that the second brick is red is $\frac{7}{10}$.

Calculate the value of t.

$t =$ ..... **[4]**

9. Nov/2020/Paper_J560/06/No.12

Students are asked to choose one subject from Option A and one subject from Option B.

Option A
Economics
Geography
History
Media Studies

Option B
Art
Drama
Engineering
German
Graphics
Music
PE

If a student chooses their subjects at random, what is the probability that both subjects have the same first letter?

..... **[3]**

10. Nov/2020/Paper_J560/06/No.15

A bus company has a large number of buses.
25% of the buses are more than 10 years old.

If a bus is more than 10 years old, the probability that it will start first time is 0.3.
If a bus is less than 10 years old, the probability that it will start first time is 0.65.

Amir is asked to drive one of the company's buses, chosen at random.

Calculate the probability that the bus starts first time.

..... **[4]**