



CAMBRIDGE
International Examinations

MATHEMATICS (EXTENDED) 0580
IGCSE MAY/JUNE 2020

REVISION 12
PROBABILITY

NOTES:

1. In this question, give all your answers as fractions.

A box contains 3 red pencils, 2 blue pencils and 4 green pencils.
Raj chooses 2 pencils at random, without replacement.

Calculate the probability that

(a) they are both red

Answer: [2]

(b) they are both the same colour

Answer: [3]

(c) exactly one of the two pencils is green

Answer: [3]

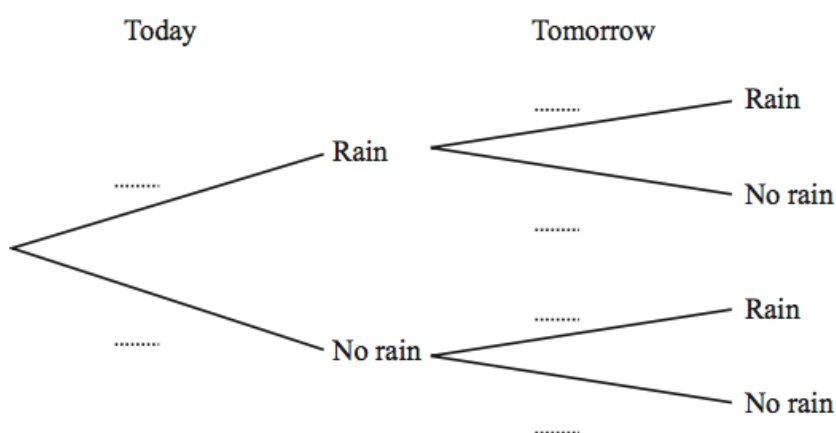
2. In all parts of this question, give your answer as a fraction in its lowest terms.

- (a) (i) The probability that it will rain today is $\frac{1}{3}$.
 What is the probability that it will not rain today?

Answer: [1]

- (ii) If it rains today, the probability that it will rain tomorrow is $\frac{2}{5}$.
 If it does not rain today, the probability that it will rain tomorrow is $\frac{1}{6}$.

Complete the tree diagram. [2]



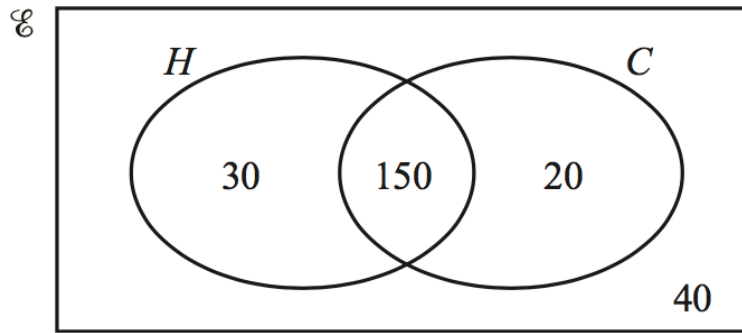
- (b) Find the probability that it will rain on at least one of these two days.

Answer: [3]

- (c) Find the probability that it will rain on only one of these two days.

Answer: [3]

3.



$\epsilon = \{240 \text{ passengers who arrive on a flight in Cyprus}\}$

$H = \{\text{passengers who are on holiday}\}$

$C = \{\text{passengers who hire a car}\}$

(a) Write down the number of passengers who

(i) are on holiday

Answer: [1]

(ii) hire a car but are not on holiday

Answer: [1]

(b) Find the value of $n(H \cup C)$.

Answer: [1]

(c) One of the 240 passengers is chosen at random.
Write down the probability that this passenger

(i) hires a car

Answer: [1]

(ii) is on holiday and hires a car.

Answer: [1]

(d) Give your answers to this part correct to 4 decimal places.

Two of the 240 passengers are chosen at random.
Find the probability that

(i) they are both on holiday

Answer: [2]

(ii) exactly one of the two passengers is on holiday.

Answer: [3]

(e) Give your answers to this part correct to 4 decimal places.

Two passengers are chosen at random from those on holiday.

Find the probability that they both hire a car.

Answer: [3]

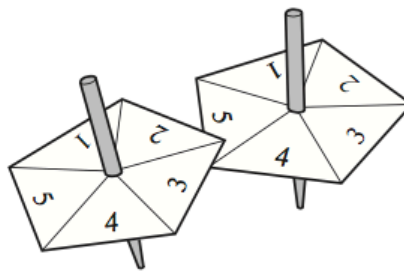
4. The Ocean View Hotel has 300 rooms numbered from 100 to 399.
A room is chosen at random.

Find the probability that the room number ends in zero.

Answer: [2]

5. Two spinners have sections numbered from 1 to 5.
Each is spun once and each number is equally likely.
The possibility diagram is shown below.

	5	+	+	+	+	+
	4	+	+	+	+	+
Second spinner	3	+	+	+	+	+
	2	+	+	+	+	+
	1	+	+	+	+	+
		1	2	3	4	5
		First spinner				



- Find the probability that
(a) both spinners show the same number

Answer: [2]

- (b) the sum of the numbers shown on the two spinners is 7.

Answer: [2]

6. A bag contains 7 white beads and 5 red beads.
Two beads are taken out of the bag at random, without replacement.

- Find the probability that
(a) they are both white

Answer: [2]

- (b) one is white and one is red

Answer: [3]

7. In this question, give all your answers as fractions.

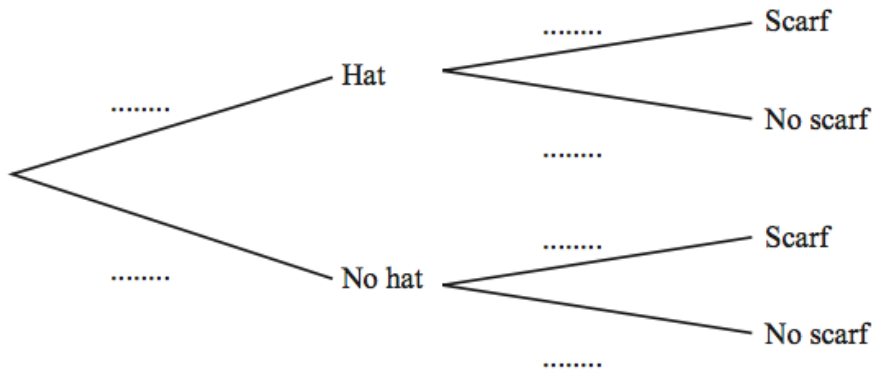
When Ivan goes to school in winter, the probability that he wears a hat is $\frac{5}{8}$.

If he wears a hat, the probability that he wears a scarf is $\frac{2}{3}$.

If he does not wear a hat, the probability that he wears a scarf is $\frac{1}{6}$.

(a) Complete the tree diagram.

[3]



(b) Find the probability that Ivan

(i) does not wear a hat and does not wear a scarf

Answer: [2]

(ii) wears a hat but does not wear a scarf

Answer: [2]

(iii) wears a hat or a scarf but not both

Answer: [2]

(c) If Ivan wears a hat and a scarf, the probability that he wears gloves is $\frac{7}{10}$.

Calculate the probability that Ivan does **not** wear all three of hat, scarf and gloves.

Answer: [3]

- 8. (a)** A square spinner is biased.
The probabilities of obtaining the scores 1, 2, 3 and 4 when it is spun are given in the table below.

Score	1	2	3	4
Probability	0.1	0.2	0.4	0.3

- (i)** Work out the probability that on one spin the score is 2 or 3.

Answer: [2]

- (ii)** In 5000, how many times would you expect to score 4 with this spinner?

Answer: [1]

- (iii)** Work out the probability of scoring 1 on the first spin and 4 on the second spin.

Answer: [2]

- (b)** In a bag, there are 7 red discs and 5 blue discs.
From the bag a disc is chosen at random and not replaced.
A second disc is then chosen at random.

Work out the probability that at least one of the discs is red.
Give your answer as a fraction.

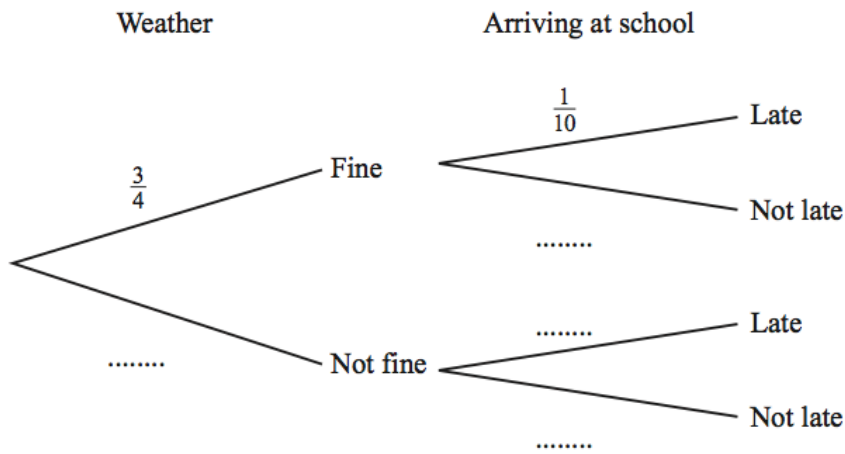
Answer: [3]

9. If the weather is fine, the probability that Carlos is late arriving at school is $\frac{1}{10}$.

If the weather is not fine, the probability that he is late arriving at school is $\frac{1}{3}$.

The probability that the weather is fine on any day is $\frac{3}{4}$.

(a) Complete the tree diagram to show this information. [3]



(b) In a school term of 60 days, find the number of days the weather is expected to be fine.

Answer: [1]

(c) Find the probability that the weather is fine and Carlos is late arriving at school.

Answer: [2]

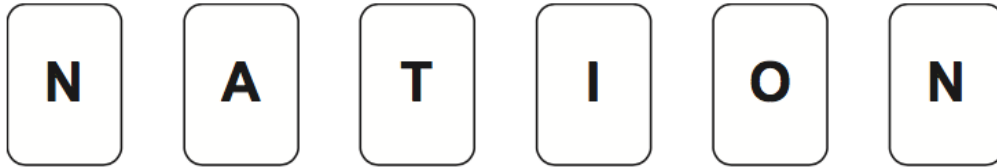
(d) Find the probability that Carlos is not late arriving at school.

Answer: [3]

(e) Find the probability that the weather is not fine on at least one day in a school week of 5 days.

Answer: [2]

10. In this question, give all your answers as fractions.



The letters of the word **NATION** are printed on 6 cards.

(a) A card is chosen at random.

Write down the probability that

(i) it has the letter **T** printed on it.

Answer: [1]

(ii) it does not have the letter **N** printed on it.

Answer: [1]

(iii) the letter printed on it has no lines symmetry.

Answer: [1]

(b) Lara chooses a card at random, replaces it, then chooses a card again.

Calculate the probability that only **one** of the cards she chooses has the letter **N** printed on it.

Answer: [3]

(c) Jacob chooses a card at random and does not replace it.

He continues until he chooses a card with the letter **N** printed on it.

Find the probability that this happens when he chooses the 4th card.

Answer: [3]

11. 7 9 20 3 9

- (a) A number is removed from the list and the median and range do not change.
Write down this number.

Answer: [1]

- (b) An extra number is included in the original list and the mode does not change.
Write down a possible value for this number.

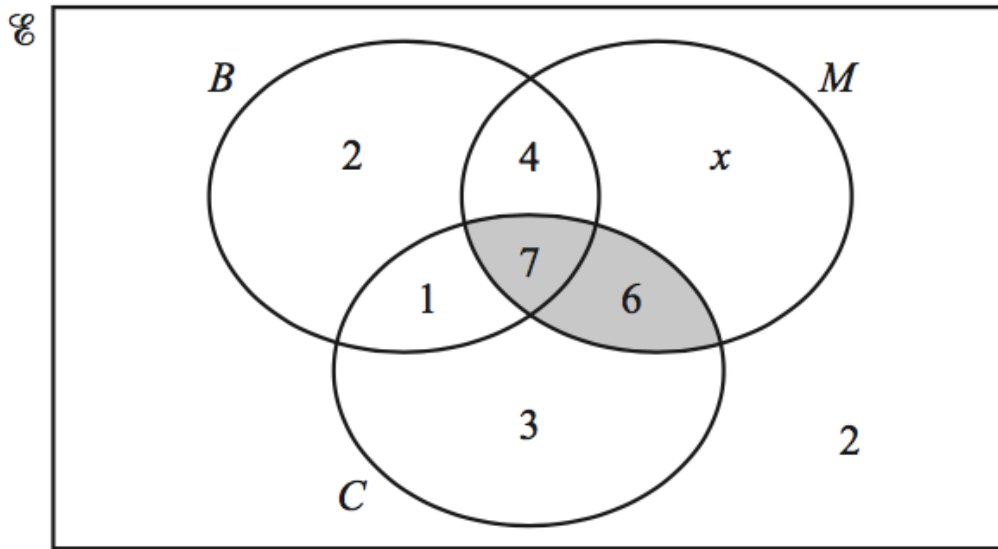
Answer: [1]

12. A biased 4-sided dice is rolled.
The possible scores are 1, 2, 3, or 4.
The probability of rolling a 1, 3 or 4 is shown in the table.

Score	1	2	3	4
Probability	0.15		0.3	0.35

Complete this table. [2]

13. 30 students were asked if they had a bicycle (B), a mobile phone (M) and a computer (C). The results are shown in the Venn diagram.



- (a) Work out the value of x .

Answer: [1]

- (b) Use set notations to describe the shaded region in the Venn diagram.

Answer: [1]

- (c) Find $n(C \cap (M \cup B)')$.

Answer: [1]

- (d) A student is chosen at random.

- (i) Write down the probability that the student is a member of the set M' .

Answer: [1]

- (ii) Write down the probability that the student has a bicycle.

Answer: [1]

- (e) Two students are chosen at random from the students who have computers. Find the probability that each of these has a mobile phone but no bicycle.

Answer: [3]

14. Gareth has 8 sweets in a bag.
4 sweets are orange flavoured, 3 are lemon flavoured and 1 is strawberry flavoured.

(a) He chooses two of the sweets at random.
Find the probability that the two sweets have different flavours.

Answer: [4]

(b) Gareth now chooses a third sweet.
Find the probability that none of the three sweets is lemon flavoured.

Answer: [2]

15.



(a) One of these 7 cards is chosen at random.
Write down the probability that the card

(i) shows the letter *A*

Answer: [1]

(ii) shows the letter *A* or *B*

Answer: [1]

(iii) does not show the letter *B*

Answer: [1]

(b) Two of the cards are chosen at random, without replacement.
Find the probability that

(i) both show the letter *A*

Answer: [2]

(ii) the two letters are different

Answer: [3]

(c) Three of the cards are chosen at random, without replacement.
Find the probability that the cards do not show the letter *C*.

Answer: [2]