

ICampSA Functions

Probability NSC Past Paper Questions



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12



www.icampsa.co.za



0676904778



admin@icampsa.co.za

Mathematics Paper 1 November 2025**Question 11**

- 11.1 A survey was conducted among female and male learners at a school about which type of cold drink they preferred. The data from the survey is presented in the table below.

	JUICE	ENERGY DRINKS	TOTAL
Female	a	b	c
Male	36	54	f
Total	e	d	210

- 11.1.1 The events male and preferring juice are independent. Show that $e = 84$. (3)
- 11.1.2 Calculate the probability that a female learner, chosen at random from the group, will like energy drinks. (3)
- 11.2 At a kiosk, 120 people buy either a cup of coffee or a bottle of water. The chance of rain on any given day is 75%. The chance of a person buying a cup of coffee on a rainy day is three times the chance of the person buying coffee on a non-rainy day.
- The probability of a person buying coffee on any given day is $\frac{7}{12}$.
- Calculate the number of cups of coffee that will be sold on a non-rainy day. (4)
- 11.3 Eight runners compete in a race where there are no tied finishes. Bongi and Andrew are two of the competitors.
- 11.3.1 Calculate the total number of possible ways in which the 8 runners can finish the race if Bongi finishes in a position immediately after Andrew. (2)
- 11.3.2 Calculate the probability that TWO OR MORE runners finish the race after Andrew and before Bongi. (4)
- [16]



Mathematics Paper 1 November 2024

Question 11 & 12

A certain number of learners are sitting for examinations in Mathematics, Tourism and Geography.

- All these learners sit for at least one of these examinations.
- The total number of learners who sit for Mathematics (M), is 22.
- The total number of learners sitting for Tourism (T), is 16.
- The total number of learners sitting for Geography (G), is 18.
- 5 learners sit for Mathematics and Tourism, but not Geography.
- 4 learners sit for Mathematics and Geography, but not Tourism.
- 3 learners sit for Tourism and Geography, but not Mathematics.
- 6 learners sit for only Tourism.

- 11.1 Draw a Venn diagram to represent ALL the learners sitting for these examinations. (3)
- 11.2 Calculate the probability that a learner, chosen at random, will sit for examinations in at least TWO of the subjects. (2)
- 11.3 Determine if the events: sitting for examinations in Mathematics and sitting for examinations in Tourism are independent. Support your answer with the necessary calculations. (4)
- [9]

QUESTION 12

A company generates a 4-character code using the 26 letters of the alphabet and the 10 digits, from 0 to 9.

The code is in the form:

letter	digit	letter	digit
--------	-------	--------	-------

- 12.1 Determine how many different codes can be formed if letters and digits may be repeated. (2)
- 12.2 Determine how many different codes can be formed if:
- The letters D, F, I, Q, U and V may NOT be used
 - The code may NOT start with a W or a Z
 - Letters or digits may NOT be repeated
 - The code ends with an odd digit
- (4)
- 12.3 The company wishes to increase the number of 4-character codes formed in QUESTION 12.2 by allowing the letters D, F, I, Q, U and V to be used. Calculate the percentage increase in the number of different codes that can now be formed. (2)
- [8]



Mathematics Paper 1 November 2023**Question 10**

10.1 A and B are independent events. $P(A) = \frac{1}{3}$ and $P(B) = \frac{3}{4}$

Determine:

10.1.1 $P(A \text{ and } B)$ (2)

10.1.2 $P(\text{at least ONE event occurs})$ (2)

10.2 The probability that it will snow on the Drakensberg Mountains in June is 5%.

- When it snows on the mountains, the probability that the minimum temperature in Central South Africa will drop below 0°C is 72%.
- If it does not snow on the mountains, the probability that the minimum temperature in Central South Africa will drop below 0°C is 35%.

10.2.1 Represent the given information on a tree diagram. Clearly indicate the probabilities associated with EACH branch. (3)

10.2.2 Calculate the probability that the temperature in Central South Africa will NOT drop below 0°C in June 2024. (3)

10.3 Ten learners stand randomly in a line, one behind the other.

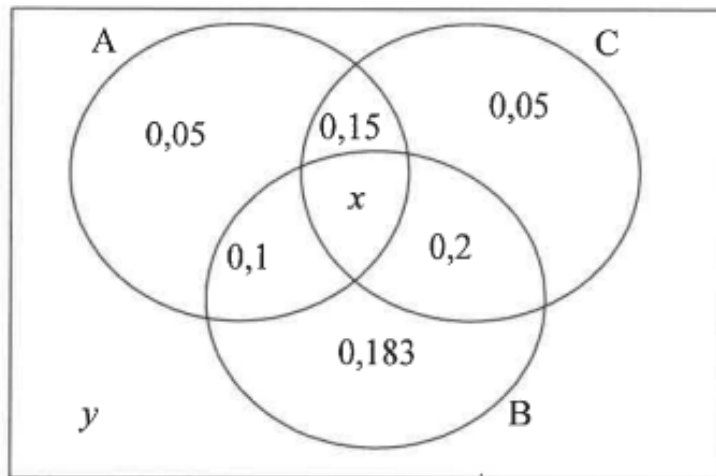
10.3.1 In how many different ways can the ten learners stand in the line? (1)

10.3.2 Calculate the probability that there will be 5 learners between the 2 youngest learners in the line. (4)
[15]



Mathematics Paper 1 November 2022**Question 10**

- 10.1 A, B and C are three events. The probabilities of these events (or any combination of them) occurring is given in the Venn-diagram below



- 10.1.1 If it is given that the probability that at least one of the events will occur is 0,893, calculate the value of:
- (a) y , the probability that none of the events will occur. (1)
 - (b) x , the probability that all three events will occur. (1)
- 10.1.2 Determine the probability that at least two of the events will take place. (2)
- 10.1.3 Are events B and C independent? Justify your answer. (5)
- 10.2 A four-digit code is required to open a combination lock. The code must be even-numbered and may not contain the digits 0 or 1. Digits may not be repeated.
- 10.2.1 How many possible 4-digit combinations are there to open the lock? (3)
- 10.2.2 Calculate the probability that you will open the lock at the first attempt if it is given that the code is greater than 5 000 and the third digit is 2. (5)
- [17]**



Mathematics Paper 1 November 2021**Question 12**

12.1 A and B are independent events. It is further given that:

$$P(A \text{ and } B) = 0,3 \text{ and } P(\text{only } B) = 0,2$$

12.1.1 Are A and B mutually exclusive? Motivate your answer. (1)

12.1.2 Determine:

(a) $P(\text{only } A)$ (4)

(b) $P(\text{not } A \text{ or not } B)$ (2)

12.2 A teacher has 5 different poetry books, 4 different dramas and 3 different novels. She must arrange these 12 books from left to right on a shelf.

12.2.1 Write down the probability that a novel will be the first book placed on the shelf. (1)

12.2.2 Calculate the number of different ways these 12 books can be placed on the shelf if any book can be placed in any position. (2)

12.2.3 Calculate the probability that a poetry book is placed in the first position, the three novels are placed next to each other and a drama is placed in the last position. (4)
[14]



Mathematics Paper 1 November 2020**Question 10**

In a certain country, 10-digit telephone numbers with the following format were introduced:

Format	Area Code	Exchange Code	Number
Number of digits	3 digits	3 digits	4 digits
Example	901	544	1230

Digits may be repeated.

10.1 How many possible 10-digit telephone numbers could be formed? (2)

10.2 Certain restrictions were placed on the groups of digits:

- Area code: must be 3 digits and the first digit can NOT be 0 or 1
- Exchange code: must be 3 digits and the first and second digits can NOT be 0 or 1
- Number: must be 4 digits and the first digit MUST be a 0 or 1

10.2.1 How many valid 10-digit telephone numbers could be formed by applying the given restrictions? (3)

10.2.2 Determine the probability that any randomly chosen 10-digit telephone number would be a valid phone number. (2)

[7]



Mathematics Paper 1 November 2020**Question 11**

Harry shoots arrows at a target board. He has a 50% chance of hitting the bull's eye on each shot.

- 11.1 Calculate the probability that Harry will hit the bull's eye in his first shot and his second shot. (2)
- 11.2 Calculate the probability that Harry will hit the bull's eye at least twice in his first three shots. (3)
- 11.3 Glenda also has a 50% chance of hitting the bull's eye on each shot. Harry and Glenda will take turns to shoot an arrow and the first person to hit the bull's eye will be the winner. Calculate the probability that the person who shoots first will be the winner of the challenge. (3)
- [8]**



Mathematics Paper 1 November 2019**Question 10**

The school library is open from Monday to Thursday. Anna and Ben both studied in the school library one day this week. If the chance of studying any day in the week is equally likely, calculate the probability that Anna and Ben studied on:

- 10.1 The same day (2)
- 10.2 Consecutive days (3)
- [5]**

iCampSA



Mathematics Paper 1 November 2019**Question 11**

- 11.1 Events **A** and **B** are independent. $P(A) = 0,4$ and $P(B) = 0,25$.
- 11.1.1 Represent the given information on a Venn diagram. Indicate on the Venn diagram the probabilities associated with each region. (3)
- 11.1.2 Determine $P(A \text{ or NOT } B)$. (2)
- 11.2 Motors Incorporated manufacture cars with 5 different body styles, 4 different interior colours and 6 different exterior colours, as indicated in the table below.

BODY STYLES	INTERIOR COLOURS	EXTERIOR COLOURS
Five body styles	Blue	Silver
	Grey	Blue
		White
	Black	Green
	Red	Red
		Gold

The interior colour of the car must NOT be the same as the exterior colour.

Motors Incorporated wants to display one of each possible variation of its car in their showroom. The showroom has a floor space of 500 m^2 and each car requires a floor space of 5 m^2 .

Is this display possible? Justify your answer with the necessary calculations. (6)
[11]



Mathematics Paper 1 November 2018**Question 11**

Given the digits: 3 ; 4 ; 5 ; 6 ; 7 ; 8 and 9

11.1 Calculate how many unique 5-digit codes can be formed using the digits above, if:

11.1.1 The digits may be repeated (2)

11.1.2 The digits may not be repeated (2)

11.2 How many unique 3-digit codes can be formed using the above digits, if:

- Digits may be repeated
 - The code is greater than 400 but less than 600
 - The code is divisible by 5
- (3)
[7]

iCampSA



Mathematics Paper 1 November 2018**Question 12**

12.1 Given: $P(A) = 0,45$; $P(B) = y$ and $P(A \text{ or } B) = 0,74$

Determine the value(s) of y if A and B are mutually exclusive.

(3)

12.2 An organisation decided to distribute gift bags of sweets to a Grade R class at a certain school. There is a mystery gift in exactly $\frac{1}{4}$ of the total number of bags.

Each learner in the class may randomly select two gift bags of sweets, one after the other. The probability that a learner selects two bags of sweets with a mystery gift is $\frac{7}{118}$. Calculate the number of gift bags of sweets with a mystery gift inside.

(6)
[9]





basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

**SENIOR CERTIFICATE EXAMINATIONS/
NATIONAL SENIOR CERTIFICATE EXAMINATIONS**

May/June Past Exam Questions



www.icampsa.co.za



0676904778



admin@icampsa.co.za

Mathematics Paper 1 May/June 2025**Question 10 & 11**

10.1 A and B are mutually exclusive events.
If $P(A) = 0,42$ and $P(A \text{ or } B) = 0,79$, calculate $P(B)$. (2)

10.2 A game at a fun park requires a player to roll a six-sided dice and pick a card from a deck of 52 cards.

A player wins if an odd number appears on the uppermost face of the dice and the player also draws a picture card from the deck.

- A deck of cards has 4 suites (hearts, diamonds, spades and clubs).
- There are 4 picture cards (king, queen, jack and ace) in every suite.

A player pays R10 to play a game and in an hour, 260 people can each play one game. If the owner wants to make a 70% profit per hour, calculate the maximum amount that the owner must pay out to each winner. (6)

[8]**QUESTION 11**

Consider the three-digit numbers from 501 up to 999.

11.1 How many of these three-digit numbers have exactly one 5 in them? (4)

11.2 Calculate the probability of a three-digit number not satisfying the condition given in QUESTION 11.1. (3)

[7]

Mathematics Paper 1 May/June 2024**Question 11**

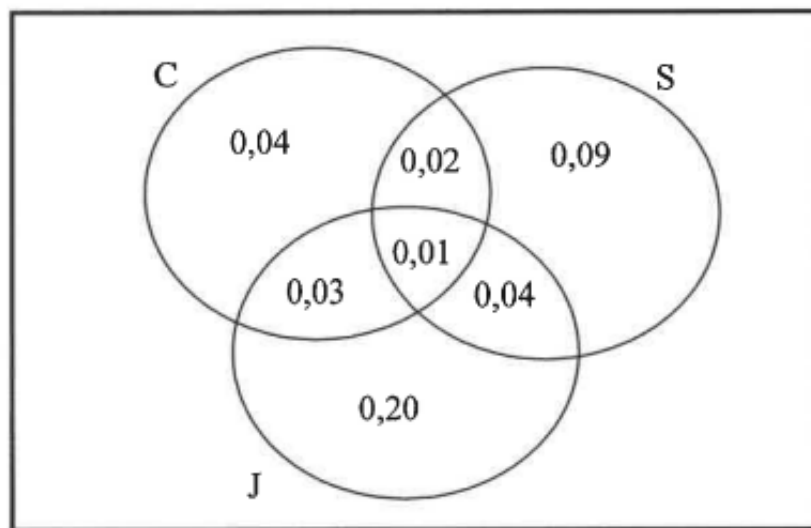
11.1 Two events, A and B, are such that:

- $P(A) = 0,4$
- $P(A \text{ or } B) = 0,52$
- A and B are mutually exclusive

Calculate $P(B)$.

(2)

11.2 The items that a learner bought at a tuck shop were recorded over a period of time. The probabilities of the learner buying a sandwich (S), a chocolate (C) and a juice (J) are shown in the Venn diagram below.



11.2.1 What is the probability that the learner will buy a sandwich?

(1)

11.2.2 Calculate the probability that the learner will buy at least two of the three items.

(2)

11.2.3 Calculate the probability that the learner would NOT buy any of the three items.

(2)



- 11.3 Seven guitar players, each with a different name, participate in a concert.
- 11.3.1 In how many different ways can the names of the guitar players be listed, one below the other, in the programme? (1)
- 11.3.2 After the performance, the guitar players wait backstage. There is a bench with only room for four to sit on.
- What will be the probability that the four guitar players will be sitting in alphabetical order, from left to right? (3)
- 11.3.3 During the performance, the seven guitar players sit in a line on stage. Four guitar players are female and three are male.
- In how many different ways can they be seated if the males may not sit next to each other? (3)
- [14]



Mathematics Paper 1 May/June 2023**Question 11**

- 10.1 A group of people participated in a trial to test a new headache pill.
- 50% of the participants received the headache pill.
 - 50% of the participants received a sugar pill.
 - $\frac{2}{5}$ of the group receiving the headache pill were not cured.
 - $\frac{3}{10}$ of the group receiving the sugar pill were cured.
- 10.1.1 Represent the given information on a tree diagram. Indicate on your diagram the probability associated with each branch as well as the outcomes. (3)
- 10.1.2 Determine the probability that a person chosen at random from the group will NOT be cured. (2)
- 10.2 Three events, A, B and C, are considered:
 $P(A) = \frac{2}{5}$, $P(B) = \frac{1}{4}$ and $P(A \text{ or } B) = \frac{13}{20}$.
- 10.2.1 Are events A and B mutually exclusive? Support your answer with the necessary calculations. (2)
- 10.2.2 Determine $P(\text{only } C)$, if it is further given that
 $P(A \text{ or } C) = \frac{7}{10}$, $P(A \text{ and } C) = \frac{2}{5}$ and $2P(B \text{ and } C) = P(A \text{ and } C)$. (3)
- 10.2.3 Determine the probability that events A, B or C do NOT take place. (2)
- 10.3 Seven friends (4 boys and 3 girls) want to stand in a straight line next to each other to take a photo.
- 10.3.1 In how many ways can the 3 girls stand next to each other in the photo? (2)
- 10.3.2 In the next photo, determine the probability that Selwyn (a boy) and Lindiwe (a girl) will NOT stand next to each other in the photo. (3)
- [17]



Mathematics Paper 1 May/June 2022**Question 10**

- 10.1 Flags from four African countries and three European countries were displayed in a row during the 2021 Olympics.

Determine:

- 10.1.1 The total number of possible ways in which all 7 flags from these countries could be displayed (2)

- 10.1.2 The probability that the flags from the African countries were displayed next to each other (3)

- 10.2 A and B are two independent events.

$$P(A) = 0,4 \text{ and } P(A \text{ or } B) = 0,88$$

Calculate $P(B)$. (3)

- 10.3 There are 120 passengers on board an aeroplane. Passengers have a choice between a meat sandwich or a cheese sandwich, but more passengers will choose a meat sandwich. There are only 120 sandwiches available to choose from. The probability that the first passenger chooses a meat sandwich and the second passenger chooses a cheese sandwich is $\frac{18}{85}$. Calculate the probability that the first passenger will choose a cheese sandwich. (5)

[13]



Mathematics Paper 1 May/June 2021**Question 11**

11.1 Two events, A and B, are such that:

- Events A and B are independent
- $P(\text{not } A) = 0,4$
- $P(B) = 0,3$

Calculate $P(A \text{ and } B)$.

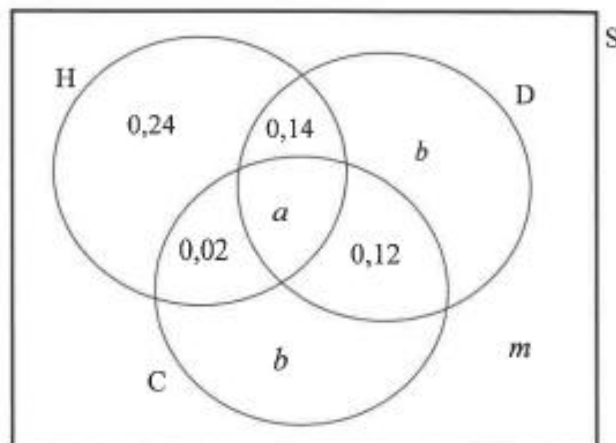
(3)

11.2 A survey was conducted among 150 learners at a school.

The following observations were made:

- The probability that a learner, selected at random, will take part in:
 - Only hockey (H) is 0,24
 - Hockey and debating (D), but not chess (C) is 0,14
 - Debating and chess, but not hockey is 0,12
 - Hockey and chess, but not debating is 0,02
- The probability that a learner, selected at random, participates in at least one activity is 0,7.
- 15 learners participated in all three activities.
- The number of learners that participate only in debating is the same as the number of learners who participate only in chess.

The Venn diagram below shows some of the above information.



11.2.1 Determine a , the probability that a learner, selected at random, participates in all three activities.

(1)

11.2.2 Determine m , the probability that a learner, selected at random, does NOT participate in any of the three activities.

(1)

11.2.3 How many learners play only chess?

(4)



Mathematics Paper 1 May/June 2021**Question 11**

- 11.3 A three-digit number is made up by using three randomly selected digits from 0 to 9. NO digit may be repeated.
- 11.3.1 Determine the total number of possible three-digit numbers, greater than 100, that can be formed. (2)
- 11.3.2 Determine the total number of possible three-digit numbers, both even and greater than 600, that can be formed. (4)
- [15]**



Mathematics Paper 1 May/June 2019**Question 10**

- 10.1 A bag contains 7 yellow balls, 3 red balls and 2 blue balls. A ball is chosen at random from the bag and not replaced. A second ball is then chosen. Determine the probability that of the two balls chosen, one is red and the other is blue. (4)
- 10.2 Learners at a hostel may choose a meal and a drink for lunch. Their selections on a certain day were recorded and shown in the partially completed table below.

		MEAL		TOTAL
		SANDWICH (S)	PASTA (P)	
DRINK	Fruit Juice (F)	a	30	b
	Bottled Water (W)			
TOTAL		200		250

The probability of a learner choosing fruit juice and a sandwich on that day was 0,48.

- 10.2.1 Calculate the number of learners who chose fruit juice and a sandwich for lunch on that day. (1)
- 10.2.2 Is the choice of fruit juice independent of the choice of a sandwich for lunch on that day? Show ALL calculations to motivate your answer. (4)
- [9]



Mathematics Paper 1 May/June 2019**Question 11**

Two learners from each grade at a high school (Grades 8, 9, 10, 11 and 12) are elected to form a sports committee.

- 11.1 In how many different ways can the chairperson and the deputy chairperson of the sports committee be elected if there is no restriction on who may be elected? (2)
- 11.2 A photographer wants to take a photograph of the sports committee. In how many different ways can the members be arranged in a straight line if:
- 11.2.1 Any member may stand in any position? (1)
- 11.2.2 Members from the same grade must stand next to each other and the Grade 12 members must be in the centre? (3)
- [6]**





Document compiled by ICampSA

ICampSA



www.icampsa.co.za



0676904778



admin@icampsa.co.za