GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

GAUTENG DEPARTMENT OF EDUCATION

PREPARATORY EXAMINATION

2019

10602

MATHEMATICAL LITERACY

PAPER 2

MARKS: 150

TIME: 3 hours

MATHEMATICAL LITERACY: Paper 2

10602E

X05

10 pages + 2 answer sheets
An Addendum of 4 pages is included as an insert in the question paper.

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INSTRUCTIONS AND INFORMATION

1. This question paper consists of FOUR questions. Answer ALL the questions.

2. Use the ADDENDUM as follows:

   Use ANNEXURE A for Question 1.3
   Use ANNEXURE B for Question 3.1
   Use ANNEXURE C for Question 4.2

   Hand in the ANSWER SHEETS for Question 1.2 AND Question 3.3 with your ANSWER BOOK.

3. Number your answers correctly according to the numbering system used in this question paper.

4. Start EACH question on a NEW page.

5. You may use an approved calculator (non-programmable and non-graphical), unless stated otherwise.

6. Show ALL calculations clearly.

7. Round-off ALL final answers appropriately according to the given context, unless stated otherwise.

8. Indicate units of measurement, where applicable.

9. Maps and diagrams are NOT necessarily drawn to scale, unless stated otherwise.

10. Write neatly and legibly.

QUESTION 1

1.1 Pat and Muzi have decided to open a perfume gallery. They rented a shop at Mokopane mall. A fixed amount of R12 000 is paid annually for electricity usage. They buy cylinders of perfume and package the perfumes in 50 mℓ bottles which are filled up to 95% capacity.

- Monthly rental fee is R3 800,00
- The empty bottles including the caps are sold in packs of 100 at R370,50.
- The total annual cost of renting the label printing machine is R6 905,00 but is paid monthly.
- The cost of a roll of self-adhesive paper labels is R65,00 and covers 50 bottles.

NB: All prices include 15% VAT.

1.1.1 Calculate the actual volume of the perfume in a 50 mℓ bottle. (2)

1.1.2 Calculate the number of bottles of perfume that can be filled using one 50 ℓ cylinder. (3)

1.1.3 Determine the sum of monthly fixed costs. (2)

1.1.4 How many rolls of self-adhesive paper labels will be needed for 1 000 bottles of perfume? (2)

1.1.5 Calculate the amount of VAT charged on the label printing machine. (4)

1.1.6 Perfume is sold in a 50 ℓ cylinder for R58 000,00 and in a 30 ℓ cylinder for R35 250,00.

(a) Which one of the refill perfumes will be cheaper? (5)

(b) Muzi said it will cost them less than R70 000 to package the first 1 000 bottles within the first month if they buy the perfume in a 50 ℓ cylinder.
Verify his claim. (6)

1.2 Pat and Muzi relocated to Polokwane where they managed to build their own shop. They found a new factory which sells perfumes in smaller 10 ℓ cylinders for R3 000,00. They decided to buy these smaller cylinders and re-package them in bottles. They sell the perfumes in bottles of 100 for R4 700,00.

1.2.1 Show that the unit selling price of the perfume is R47,00. (2)

1.2.2 Write down an equation which can be used to calculate the income from the sale of perfumes in the form:

Total Income (in Rand) = … (2)

1.2.3 ANSWER SHEET 1 has a graph showing the total cost for buying the first 900 bottles of perfume. On the same system of axes, draw the graph of the total income for these 900 bottles of perfume. (4)

1.2.4 Use the graph to explain the *break-even point* in the given context and write down the number of bottles and total income at this point. (4)

1.3 ANNEXURE A shows two types of graphs. The pie chart shows the percentages of different perfume sales for March to May. A total of 12 000 bottles of perfume was sold during this period. The incomplete bar graph shows ONLY the number of Fantasy perfumes sold for March and April.

1.3.1 Calculate the number of bottles of Fantasy perfume sold during this period. (5)

1.3.2 Pat claimed that more Fantasy perfumes were sold in May than in March. Verify his claim. (3)

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QUESTION 2

2.1 Gladys is interested in buying a Ford car. She found the following information regarding the number of Ford cars sold in America in 2017 and 2018. TABLE 1 below shows the monthly sales (in thousands) of Ford cars in 2017 and 2018.

MONTH OF YEAR	TOTAL NUMBER OF CARS SOLD (IN THOUSANDS)	
	2017	**2018**
January	163,8	154,7
February	199,7	**P**
March	226,7	235,0
April	205,0	196,1
May	230,8	233,1
June	218,7	221,1
July	191,3	186,1
August	201,2	209,5
September	213,4	189,2
October	191,5	185,0
November	201,9	**P**
December	**S**	209,2

[Adapted from fordauthority.com]

2.1.1 Calculate the value of **P** if the mean number of cars sold in 2018 is 199,5 thousand. (5)

2.1.2 (a) Determine the value of **S**, the maximum number of cars sold in 2017, if the range is 67,6 thousand. (4)

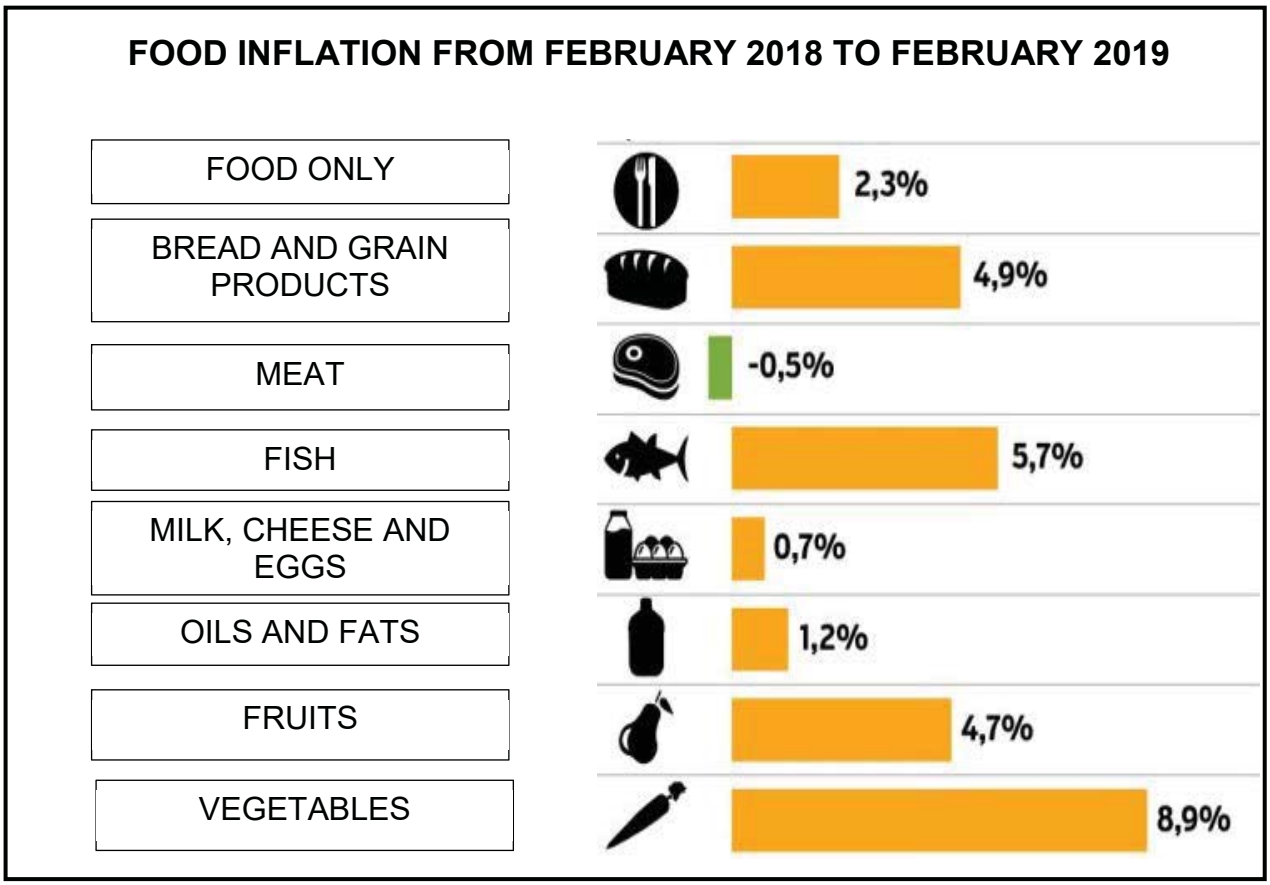
(b) Calculate the median for the number of cars sold in 2017. (4)

(c) Hence, use calculations to determine whether the interquartile range for cars sold in 2017 is less than or greater than 27 000. (6)

2.1.3 The marketing manager claimed that **on average**, the number of cars sold per month in 2018 is more than the number of cars sold per month in 2017. Verify his claim. (6)

2.1.4 Which measure of central tendency between the mode and the mean is the better representation of the set of data? (2)

2.2 The graph below indicates the inflation in selected food and drinks from February 2018 to February 2019.
Study the graph below and answer the following questions.



2.2.1 The price of bread in February 2019 was R13,99. Determine what the cost of bread was in February 2018. (5)

2.2.2 Explain what -0,5% on the graph means in this context. (2)

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PLEASE DETACH THIS ADDENDUM OF 4 PAGES.

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MATHEMATICAL LITERACY

ADDENDUM

PAPER 2

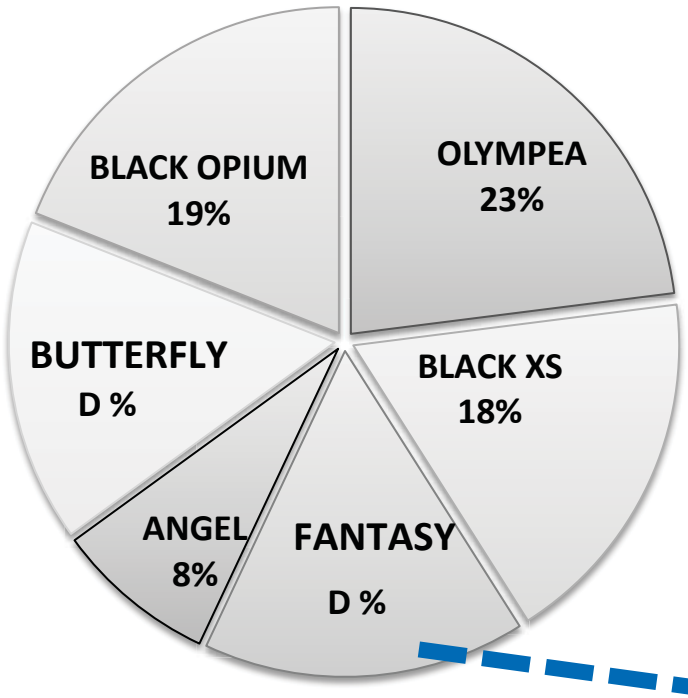
4 pages

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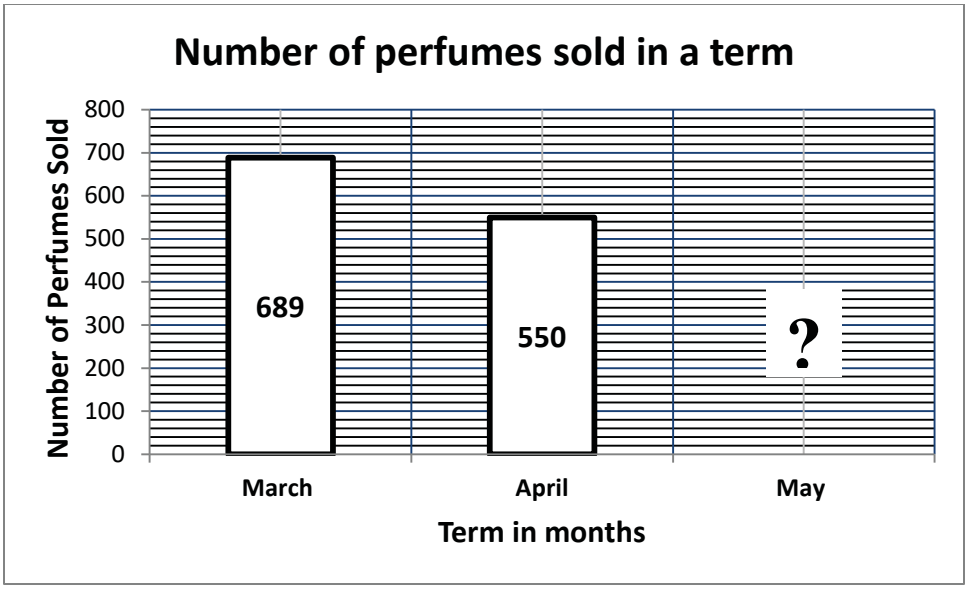
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ANNEXURE A : QUESTION 1.3

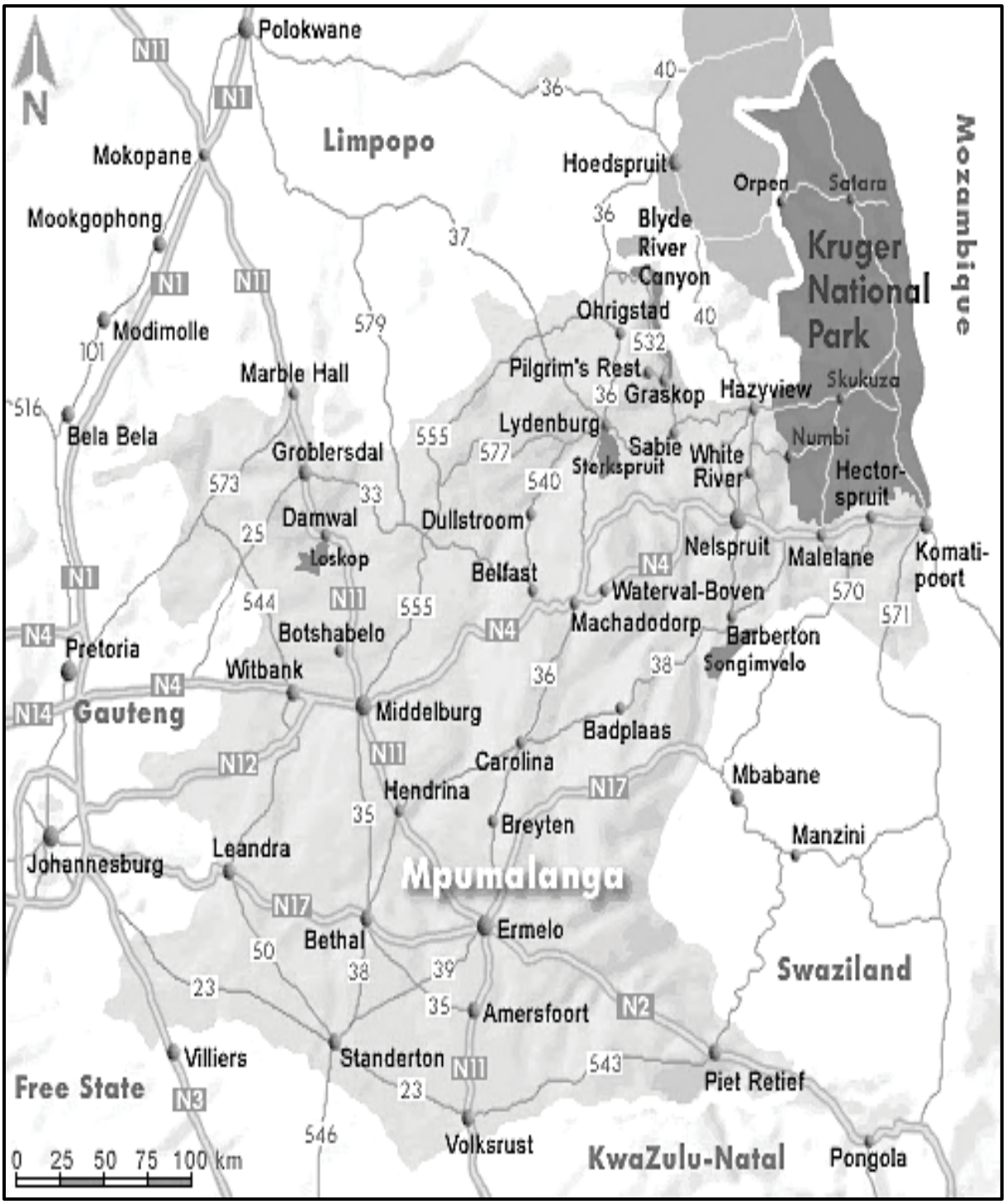
PERCENTAGES OF PERFUMES SOLD FROM MARCH - MAY



D represents unknown percentages of perfumes indicated in the pie chart



ANNEXURE B: QUESTION 3.1



ANNEXURE C : QUESTION 4.2

TAX TABLE FOR INDIVIDUALS TAX YEAR: MARCH 2018 – FEBRUARY 2019	
Taxable income in ZAR	**Tax rate in ZAR**
0 – 195 850	18% of taxable income
195 851 – 305 850	35 253 + 26% of taxable income above 195 850
305 851 – 423 300	63 853 + 31% of taxable income above 305 850
423 301 – 555 600	100 263 + 36% of taxable income above 423 300
555 601 – 708 310	147 891 + 39% of taxable income above 555 600
708 311 – 1 500 000	207 448 + 41% of taxable income above 708 310
1 500 001 and above	532 041 + 45% of taxable income above 1 500 000

Tax rebates	**Amount in ZAR**
Primary (age below 65)	R14 067
Secondary (age 65 and over)	R7 713
Tertiary (age 75 and over)	R2 574

Monthly medical credits in ZAR	
Main member	R310
First dependant	R310
Each additional dependant	R209

END

QUESTION 3

3.1 Students from the University of Limpopo are undertaking a trip from Polokwane to Middelburg for in-service training. They have hired a bus from Mayi's Luxury Bus Company. Professor Du Toit and Dr Nkomo are academic organizers for this in-service training.

Study the map on **ANNEXURE B** and answer the following questions.

3.1.1 What is the general direction of Middelburg from Polokwane? (2)

3.1.2 Describe a detailed set of directions that they will take to travel from Polokwane to Middelburg, using national roads. (5)

3.1.3 Write ONE advantage of using the national roads. (2)

3.1.4 Use the bar scale on the map to calculate the actual distance that they travelled from Polokwane to Middelburg, as the crow flies.

Write your answer in miles if **1 mile = 1,61 km** (7)

3.1.5 The bus was travelling at an average speed of 120 km/h and they stopped twice for 20 minutes at each stop. Zinzi claimed that it will take them 3 hours, 47 minutes to reach Middelburg. Verify her claim.

Use the formula : **Distance = Average speed × time** (6)

3.2 Mr Mayi, who is regularly in Liberia, deposits 65% of his income into his wife's account. The company has paid him R13 500,00.

3.2.1 Apart from taking care of his basic needs, for what other reason do you think Mr Mayi keeps the 35% of his income? (2)

3.2.2 How much did he deposit into his wife's account in Liberian dollars (LRD), if 1 LRD = 0,091 Rands? (4)

3.3 The bus stopped at Groblersdal for lunch and the following menu was served for lunch. The students had to choose one item from each category.

Category 1	**Starch**	Dumpling (D)	Rice (R)
Category 2	**Salad**	Tuna salad (T)	Potato salad (P)
Category 3	**Meat**	Beef stew(B)	Mutton stew (M)

3.3.1 Complete the tree diagram on ANSWER SHEET 2 to show all possible outcomes of this event. (3)

3.3.2 Hence, determine the probability of choosing a meal with beef. (2)

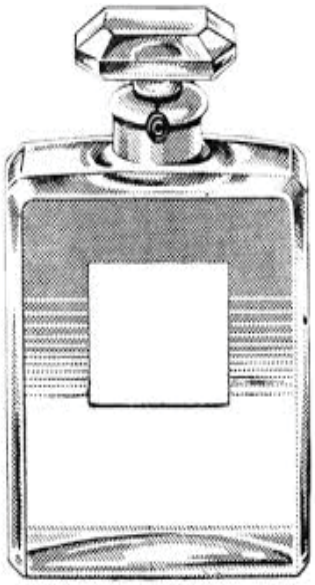
[33]

QUESTION 4

4.1 Peter, the sales manager at HGM, and his team discussed strategies to improve their sales of perfume. They intend using four different strategies.

4.1.1 The first strategy is to package their perfume using a rectangular bottle and a cylindrical bottle. They have decided to price the bottles differently. The bottles will be filled to 95% capacity.

The picture below shows the bottles and the dimensions of the bottles.

Cylindrical bottle	**Rectangular bottle**
	
Diameter = 6 cm Height = 1,6 cm	Length = 5 cm Breadth = 2 cm Height = 45 mm

(a) Why are the perfume bottles not filled to 100% capacity? (2)

(b) State, without any calculations and giving a reason for your choice, which bottle of perfume will be priced higher. (2)

(c) Use calculations to prove that if the volumes of the bottles are rounded-off to the nearest whole number, the capacity of the bottles is the same. Leave your answer in cubic centimetres.

The following formulae may be used :

Volume of a rectangular bottle = $\ell \times b \times h$

Volume of a cylindrical bottle $= \pi \times (radius)^2 \times height$

The value of $\pi = 3,142$ (8)

4.1.2 The second strategy they discussed was to give a free gift of bath salts to customers who spent more than R500,00. Each bottle of bath salts will be filled using three measuring cylinders of equal dimensions as indicated below.

3 MEASURING CYLINDERS **BOTTLE OF BATH SALTS**





Radius = 2,5 cm
Height = 10 cm

NB: 1 g = 1 cm^3 = 1 ml

The bottle of bath salts has a capacity of 600 g.
Use calculations to show that the salt granules from three measuring cylinders will fit into the bath salts bottle.

You may use the following formula:

Volume of a cylindrical bottle $= \pi \times (radius)^2 \times height$

The value of $\pi = 3,142$ (5)

4.1.3 The third strategy was to sell different types of perfumes with differing ratios of **perfume : oil : alcohol**.

Type of perfume	Ratio perfume : oil : alcohol
EDT	5 : 90 : 5
EDP	12 : 85 : 3

The manager claimed that the difference in the amount of oil (rounded to the nearest unit) between the two types of perfumes in a 45 mℓ bottle is, 3 mℓ.

Verify his claim by showing calculations? (6)

4.1.4 The last strategy is to have monthly competitions where customers can win prizes.
The prizes are hidden behind the letters of the word "**CONCENTRATION**" and the chosen letter is not replaced. The chosen letter is then removed and cannot be chosen again.

The first customer randomly chose the letter "**R**".

Determine the probability that the second letter chosen will be a "**C**". (3)

4.2 Paul, who is 52 years old, is an employee at a Research Company. He earned an annual income of R338 000 for the 2018/2019 tax year.

- He contributes 7,5% of his basic salary to the pension fund.
- He also donates R46 800 per annum to a registered charity organisation. The donation is tax deductible.
- He contributes R4 550 to the medical aid monthly, for himself and his 2 children.

- ANNEXURE C is a tax table for individuals for the tax year: March 2018 – February 2019

Use ANNEXURE C to answer the following questions.

4.2.1 Show, using calculations, that his taxable income is R267 800,00. (5)

4.2.2 Determine his annual medical credits. (3)

4.2.3 Hence, calculate his annual income tax. (5)

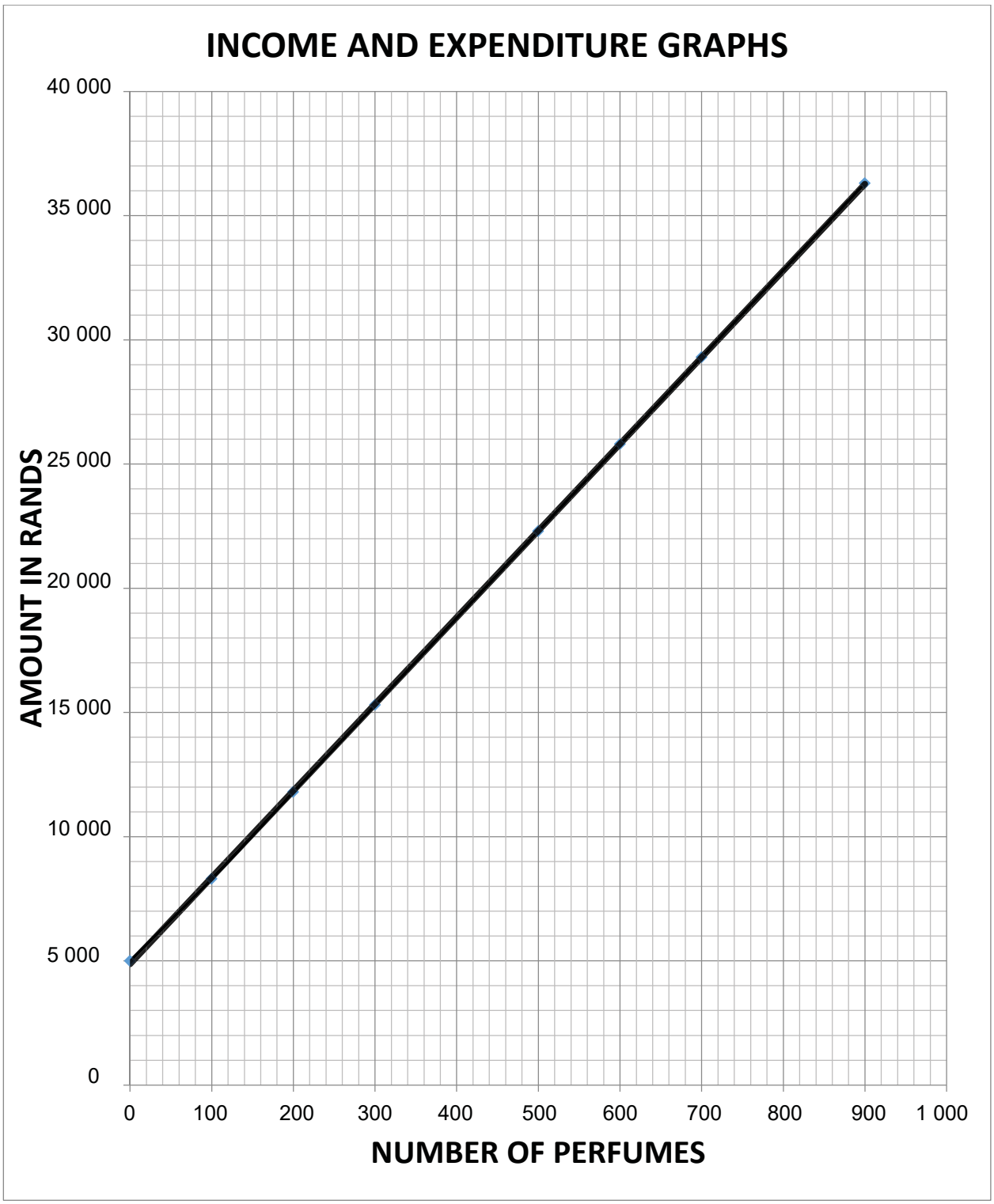
[39]

TOTAL: 150

END

ANSWER SHEET 1: QUESTION 1.2

NAME: _____ **GRADE 12:** _____



ANSWER SHEET 2: QUESTION 3.3

NAME: _____ **GRADE 12:** _____

