



Province of the
EASTERN CAPE
EDUCATION

NATIONAL SENIOR CERTIFICATE

GRADE 12

SEPTEMBER 2011

MATHEMATICAL LITERACY P2

MARKS: 150

TIME: 3 hours



This question paper consists of 15 pages,
including an annexure of 4 pages.

INSTRUCTIONS AND INFORMATION

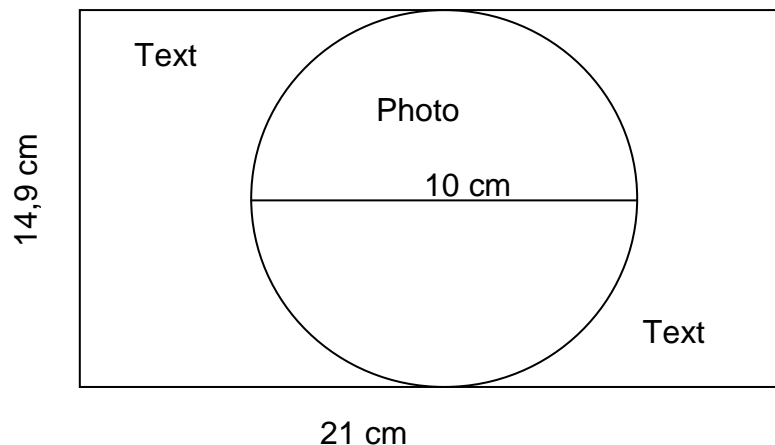
Read the following instructions carefully before answering the questions.

1. This question paper consists of FOUR questions. Answer ALL the questions.
2. QUESTIONS 1.3.1, 1.3.2, 3.3 and 4.2.1 and 4.2.2 must be answered on the attached ANNEXURES 1, 3 and 4. Write your name in the spaces provided and hand in the annexure with the ANSWER BOOK.
3. Number the questions correctly according to the numbering system used in this question paper.
4. An approved calculator (non-programmable and non-graphical) may be used, unless stated otherwise.
5. ALL calculations must be shown clearly.
6. ALL the final answers must be rounded off to TWO decimal places, unless stated otherwise.
7. Start EACH question on a NEW page.
8. Write neatly and legibly.

QUESTION 1

A couple, Tom and Tina, decided to get married. In order to plan a wedding with guests requires a lot and there are many costs that they have to consider, such as invitation cards, the venue and the catering.

- 1.1 The invitation card will be designed in a rectangular shape as illustrated below. A photo of them will be inserted in the centre of the invitation and will have a circular shape. The information (text) will be on both sides of the circle. (Diagram not drawn to scale).



- 1.1.1 Calculate the area that will be used for the photo. Use the formula: $\text{Area} = \pi r^2$. (Use $\pi = 3,14$) (3)
- 1.1.2 Only the area on both sides of the photo will be used for text. Calculate this area. Use the formula: $\text{Area} = l \times b$ (4)
- 1.1.3 A printing company charges them R0,06c per cm^2 for the text and R0,45c for inserting the photo on each card. How much will they pay for 1 invitation card? (3)
- 1.1.4 Their budget for the invitations must not exceed R2 000. They have 150 guests whom they would like to invite. Will there be enough invitation cards to give to all the guests? Show all your calculations. (5)

- 1.2 Tom and Tina have to choose between two venues that they like most and that will accommodate their 150 guests. The cost of the two venues is listed below and includes the décor.

Option 1: R3 000 for the hiring of the venue plus R145 per person for the meal.

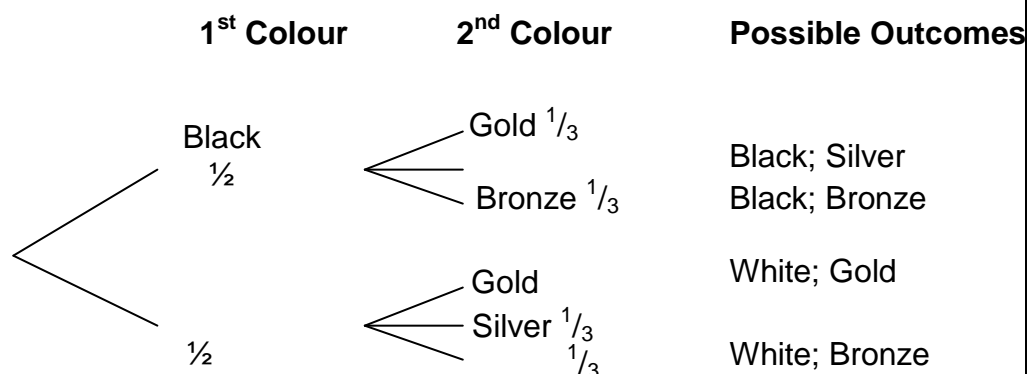
Option 2: No fee for the hiring of the venue and R190 per person for the meal.

- 1.2.1 Write down a formula that can be used to calculate the cost for Option 1. Use (C) for cost and (n) for the number of people. (3)

- 1.2.2 In order to keep the cost as low as possible, they have to choose between two options. Which one of the two options will you suggest they choose? Show all your calculations. (7)

- 1.3 The manager of the venue they chose asks them to choose a colour scheme for the décor. They have to choose between two basic colours, black and white, and to match it with gold, silver or bronze.

The following incomplete tree diagram has been drawn to show all the possible outcomes of the colour schemes:



- 1.3.1 Complete the tree diagram (ANNEXURE 1) to show all the possible outcomes for the colour schemes. (7)

- 1.3.2 Use the completed tree diagram to determine the probability of Tim and Tina choosing white and gold as colour scheme for their wedding (ANNEXURE 1). Show your calculations. (3)

[35]

QUESTION 2

- 2.1 Tom and Tina got married on the 30th April 2011. For their honeymoon they travelled from Port Elizabeth to Cape Town for one week (7 days). They travelled on the National Road (N2).

Study the route map from Port Elizabeth to Cape Town (ANNEXURE 2) to answer the questions below:

- 2.1.1 They drove for 227 km and stopped to rest. What is the name of the town where they stopped? (2)
- 2.1.2 What is the distance that they travelled from Riverdale to Swellendam? (2)
- 2.1.3 On most national routes Toll Plazas have to be passed. How many Toll Plazas did they go through? (1)
- 2.1.4 The distance between Port Elizabeth and Cape Town is 757 km. If they travelled at an average speed of 100 km/h, how long will the trip take them to reach Cape Town? Give your answer in hours and minutes.
- Use the formula: Distance = Speed x Time (4)
- 2.1.5 With reference to your answer in QUESTION 2.1.4, if they left Port Elizabeth at 10:00, at what time will they have arrived in Cape Town? Take into account that they had two stops to rest. One stop for half an hour and the second stop for 45 minutes. (3)

- 2.2 The following table illustrates the petrol price (in cents per litre) from 2 March – 4 May 2011. The car that Tom and Tina are driving uses unleaded 93 petrol.

Table 1: Price of petrol from 2 March – 4 May 2011

Automobile Association of South Africa (AA)

Petrol	Inland			Coast		
	Unleaded		LRP	Unleaded		LRP
	93	95	93	93	95	95
2 March 2011	927	942	927	915	918	918
6 April 2011	980	996	980	963	966	966
4 May 2011	1009	1025	1009	992	995	995

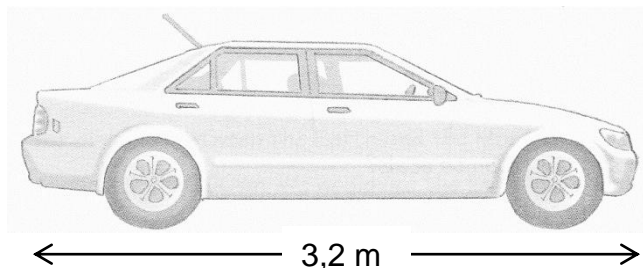
To answer the following questions it will be useful to use the map (ANNEXURE 2) with the table.

- 2.2.1 The fuel tank of the car has a capacity of 45 ℓ (litre). The couple left for honeymoon on the 1st of May. Calculate the price that they paid to fill the tank of the car if the car was completely empty. (3)
- 2.2.2 On average a car uses 1 litre of fuel for every 10,2 km.
- (a) Where will they have to fill up again before their tank runs empty? Show all your calculations. (4)
- (b) Was the petrol price the same in the town mentioned in (a) as it was in Port Elizabeth? If not, write down the price and give a reason for your answer. (3)
- (c) Calculate the difference in fuel price between when they filled up in Port Elizabeth and the town mentioned in (a). (4)
- 2.2.3 The petrol price in May increased to R9,92 in coastal regions. Calculate the percentage increase.

Use the formula:

$$\% \text{ increase} = \frac{\text{New value} - \text{Old value}}{\text{Old value}} \times 100 \quad (4)$$

- 2.3 The following is a scale drawing of the car that they drove. The actual length of car is 3,2 m.



- 2.3.1 Measure the length of the car in centimetres. (2)
- 2.3.2 Use the measurement in QUESTION 2.3.1 to work out the scale of the drawing. (4)
- 2.3.3 Explain what the calculated scale means. (2)

- 2.4 All vehicles receive a registration number once the car is registered. This is indicated on the number plate of the vehicle.

In the Eastern Cape the number plate consists of three letters of the alphabet followed by three numbers with EC (Eastern Cape) at the end. The following is an example of such a number plate.

XYZ 123 EC

- 2.4.1 For the first set of the number plate the letters of the alphabet are used. However, vowels are not used for registration purposes.
- (Ignore personalised number plates for this question)
- (a) How many possible letters can be used for the first letter? (2)
- (b) What is the probability that the first letter of the number plate of the vehicle that Tom and Tina drive starts with a letter "F"? (3)
- 2.4.2 For the three numbers (the second set), only the numbers 0 – 9 can be used and it can be repeated.
- (a) How many possible combinations of numbers are there? (3)
- (b) What is the probability that the car Tom and Tina drive have a number plate starting with the number 9? (3)

QUESTION 3

In 2010 the George Municipality was declared a water scarce area as the dam levels on the Garden Route decreased to well below 60% capacity. Rashid Kahn: Director of Water Affairs, Western Cape said "Water is a scarce resource which must be conserved and used responsibly."

- 3.1 The following table shows the "Emergency water tariffs" that was introduced during the water shortage period.

Table 2: Water tariffs for George during the water shortage period

Water usage in kilolitre (kℓ)	Tariff per kℓ
0 – 6 kℓ	<i>FREE</i>
+6 – 12 kℓ	R8,32
+12 – 20 kℓ	R10,82
+20 – 30 kℓ	R16,76
+30 – 50 kℓ	R29,34
+50 kℓ	R58,68

- 3.1.1 (a) Mr. Lanela's household uses 18 kℓ of water on average per month. Calculate how much Mr. Lanela had to pay for his water bill. (3)
- (b) During one of the months Mr. Lanela had a water leakage. When he received his municipal account, it indicated that he had to pay R203,52 for water usage. How many kiloliters (kℓ) of water were used during this month? (5)

- 3.1.2 In November 2010 the George municipality decided to revert back to the normal water tariffs with effect from 1 January 2011 due to the fact that dam levels increased to above 60%.

The following table shows the normal water tariffs.

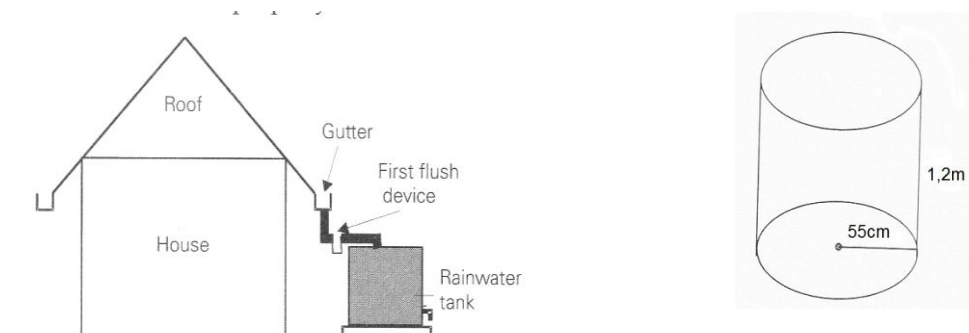
Tabel 3: Water tariffs for George during normal circumstances

Water usage in kilolitre (kℓ)	Tariff per kℓ
0 – 6 kℓ	<i>FREE</i>
+6 – 12 kℓ	R8,32
+12 – 20 kℓ	R9,58
+20 – 30 kℓ	R11,49
+30 – 50 kℓ	R13,79
+50 kℓ	R15,73

- How much did Mr. Lanela save on his average water bill in January 2011 under normal circumstances in comparison with the "Emergency water tariffs"? (4)

- 3.2 During the water shortage period, Mr. Lanela decided to install a rainwater tank on one side of his house.

Below is a picture that shows the installed rainwater tank and next to it the dimensions of the rainwater tank (not drawn to scale).



Calculate the volume of water that the tank can hold.

Use the formula, $\text{Volume} = \pi r^2 h$ and $\pi = 3,14$

Express your answer in kiloliters. ($1\,000\text{ cm}^3 = 1\text{ l}$; $1\,000\text{ l} = 1\text{ kl}$)

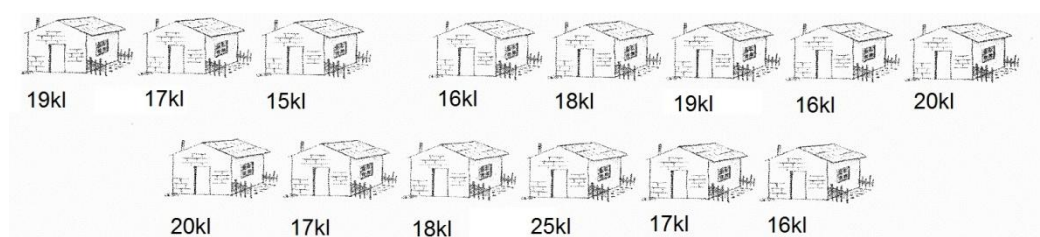
(6)

- 3.3 Suppose the tank has a capacity of 1 000 l on day 1. After day 1 Mr. Lanela uses 100 l of water per day. Determine by drawing a graph (ANNEXURE 3) how long it will take for the tank to run empty. (Assume no rain fell for 20 days).

Label both axes clearly and give a suitable heading for your graph.

(10)

- 3.4 The following picture shows the area in which Mr. Lanela lives. He recorded how many kiloliters of water each household uses during a month.



- 3.4.1 Calculate the mean (average) of how many kiloliters of water are used per month.

(3)

- 3.4.2 Determine the median of the data set.

(3)

- 3.4.3 Calculate the range of the data set.

(2)

- 3.4.4 Which indicator (mean, median or range) cannot be used to describe how many kiloliters of water are used per month? Give a reason for your answer.

(3)

[39]

QUESTION 4

Ms. Rennet is a retired advocate. She always wanted to be a business woman, but did not have the time to fulfil her dream. With the money that was paid out to her, she decided to start a business which specialises in selling handbags.

Ms. Rennet buys the bags directly from the factory.

- Ms. Rennet must pay VAT (Value Added Tax) to the factory for the bags.
- The factory has to pay the VAT to SARS (South African Revenue Service).
- When customers buy bags from Ms. Rennet they pay VAT to her and she has to pay VAT to SARS.

PLEASE NOTE:

Ms. Rennet will not pay all the VAT that she receives from her customers to SARS. The VAT that she has to pay to SARS is the difference between what she received from her customers and what she paid to the factory.

- 4.1 Ms. Rennet buys 500 handbags from the factory at R120 each (excluding VAT). She then sells the handbags to her customers for R190 each (VAT inclusive).

4.1.1 Calculate how much VAT the factory has to pay to SARS for the bags that Ms. Rennet bought. (3)

4.1.2 How much VAT does Ms. Rennet receive from her customers for the bags? (5)

4.1.3 Ms. Rennet also has to pay SARS for the VAT she received from her customers. How much VAT will she pay to SARS? (2)

- 4.2 Ms. Rennet is renting a premises at a cost of R2 000 per month from where she sells her handbags.
On a visit to another factory, Ms. Rennet came across a sale for handbags at R100 each (VAT inclusive).

Ms. Rennet bought 70 handbags and decided to sell it at R150 each.

Table 4: Expenses (rent plus number of bags) and income of the number of bags sold.

No. of bags	0	20	30
Expenses in rand	2 000	4 000	5 000
Income in rand	0	3000	4 500

Please note: The table is incomplete and can be helpful.

- 4.2.1 Use the table and the given information to draw a graph (ANNEXURE 4) showing Ms. Rennet's expenses up to 70 bags.

Label the graph as "EXPENSES". (5)

- 4.2.2 Use the table and the given information to draw a second graph (ANNEXURE 4) showing Ms. Rennet's income up to 70 bags on the same set of axes.

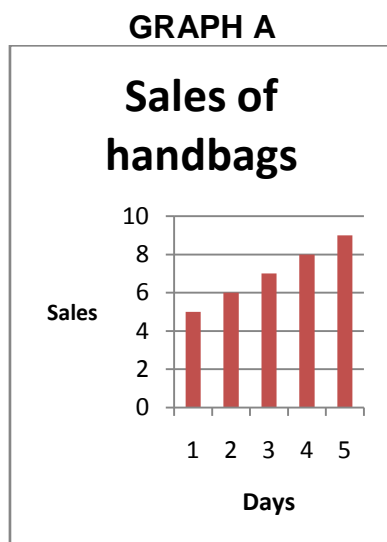
Label the graph as "INCOME". (5)

- 4.3 Use the two graphs to answer the following questions:

- 4.3.1 How many bags must Ms. Rennet sell to break even? (2)

- 4.3.2 What can be noticed before the break-even point? Refer to income and expenses. (2)

- 4.4 Ms. Rennet claims that her sales increased from day 1. She illustrates her statement by drawing two graphs.



One of the graphs is misleading. Write down which graph (A or B) is misleading and give a reason for your answer.

(3)
[27]

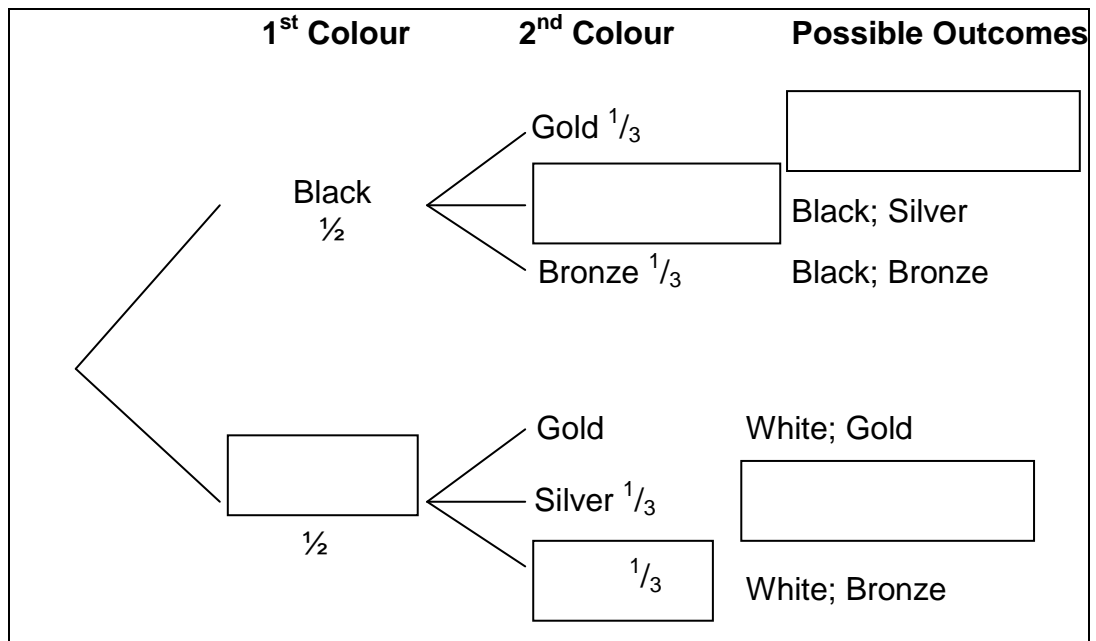
TOTAL: 150

ANNEXURE 1

QUESTION 1.3.1

NAME: _____

(To be handed in)



(7)

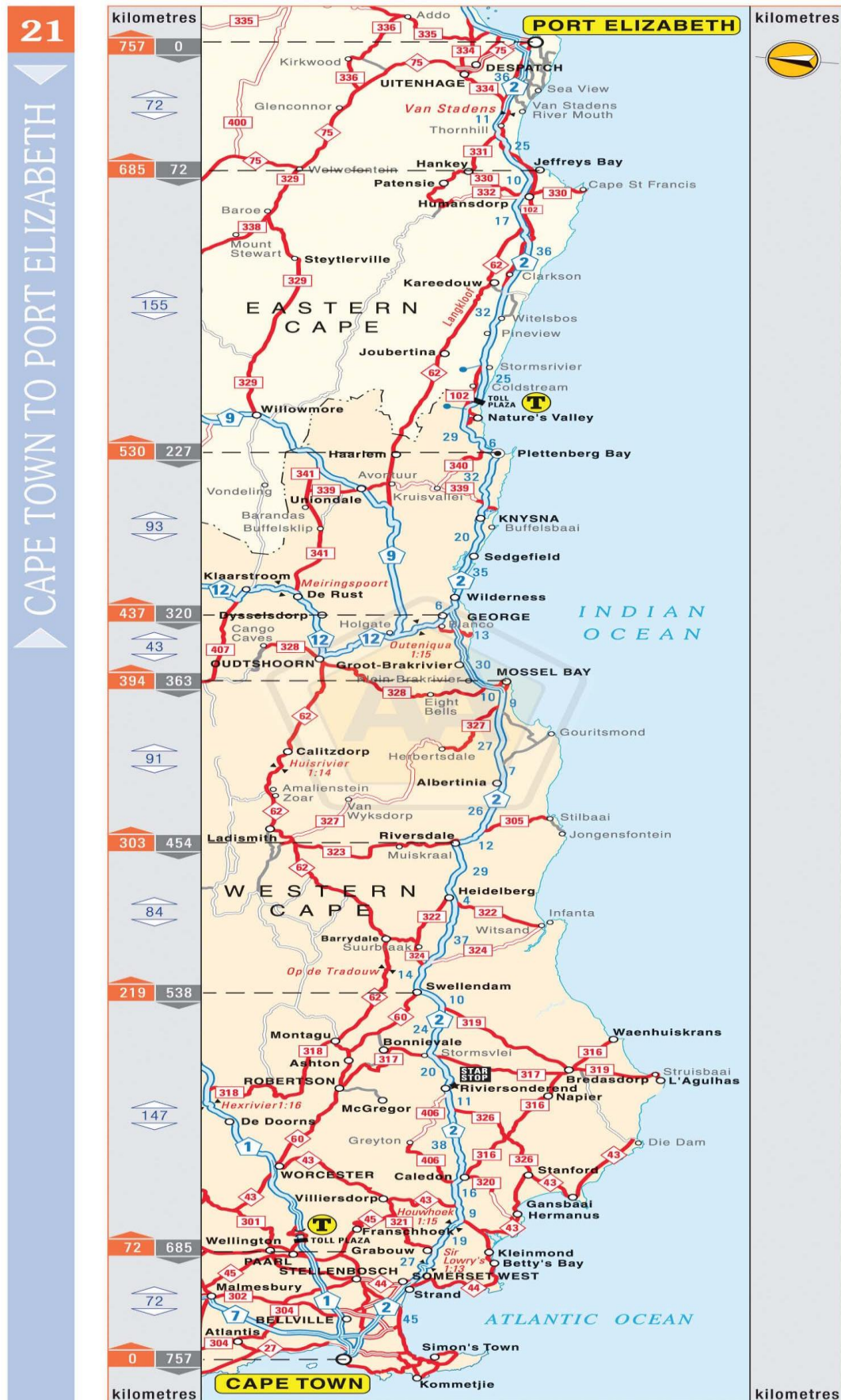
1.3.2 _____

(3)

ANNEXURE 2

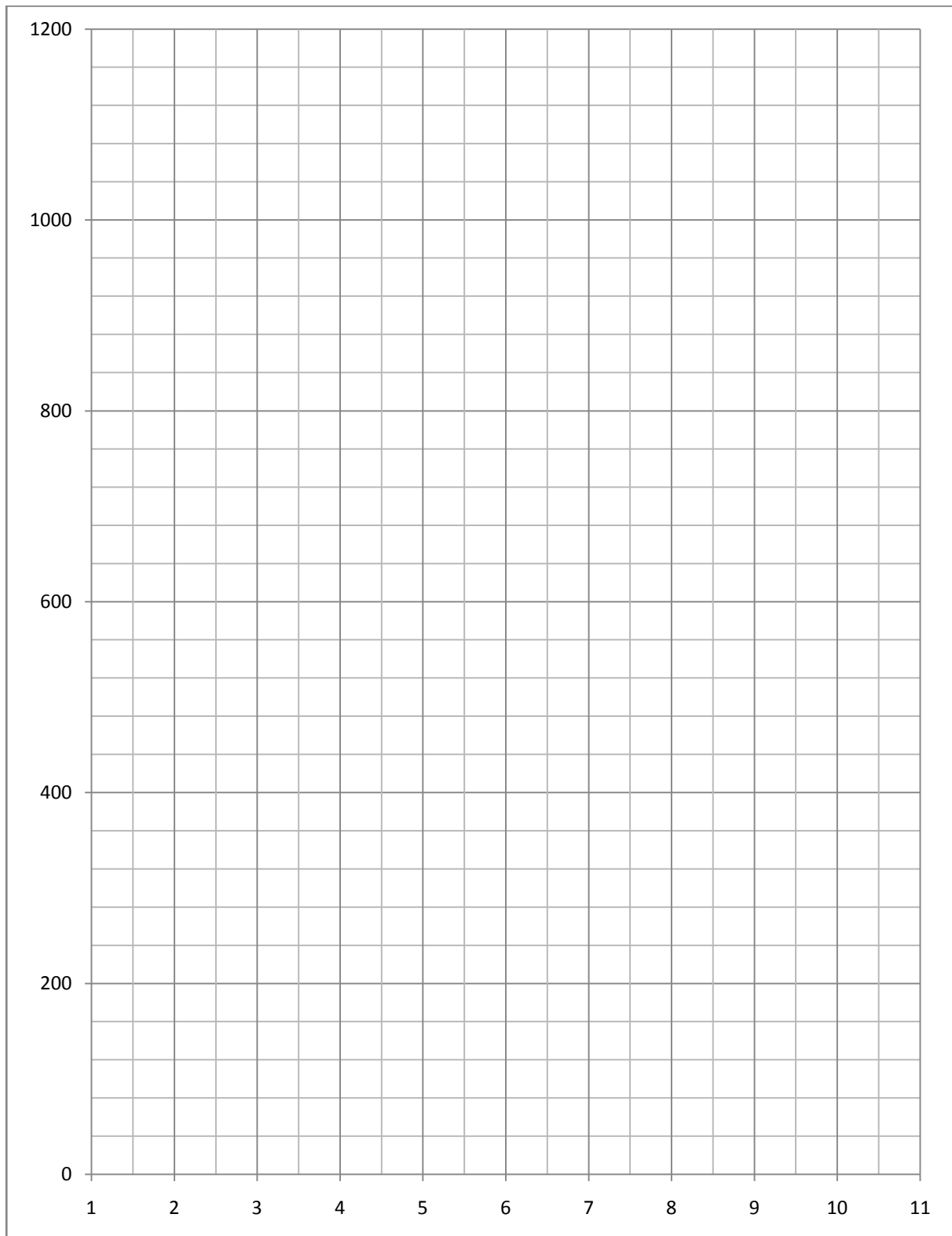
QUESTION 2.1 / 2.2

AA of South Africa



ANNEXURE 3**QUESTION 3.3****NAME:** _____

(To be handed in)



ANNEXURE 4**QUESTION 4.2.1 / 4.2.2****NAME:** _____

(To be handed in)

Income and Expenses