



Province of the
EASTERN CAPE
EDUCATION

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

JUNE 2016

MATHEMATICAL LITERACY P1

MARKS: 100

TIME: 2 hours



This question paper consists of 14 pages, including 3 annexures
and 1 answer sheet.

INSTRUCTIONS AND INFORMATION

1. This question paper consists of FIVE questions.
2. Answer ALL the questions.
3. Use the ANNEXURES to answer the following questions:

ANNEXURE A for QUESTION 3.1

ANNEXURE B for QUESTION 3.2 (Table 1 and 2).

ANNEXURE C for QUESTION 4.2 (Table 3)

ANSWER SHEET 1 for QUESTION 5.1.2

Write your GRADE and your NAMES in the spaces provided on the ANSWER SHEET and hand it in with your ANSWER BOOK.

4. Number the questions correctly according to the numbering system used in this question paper.
5. Diagrams are NOT necessarily drawn to scale.
6. Round off ALL the final answers according to the context used, unless stated otherwise.
7. Indicate units of measurement, where applicable.
8. Start EACH question on a NEW page.
9. Show ALL calculations clearly.
10. Write neatly and legibly.

QUESTION 1

Mambo SSS, is a small private school in the Lady Frere area of the Eastern Cape. In 2015 it had a total of 167 registered learners that were as follows:

GRADE	GIRLS	BOYS	TOTAL
8	21	18	39
9	15	20	35
10	13	7	20
11	19	A	B
12	25	17	42
TOTAL	93	74	167

Fees are payable according to the grade. A learner in Grade 8 or 9 paid R300 per month for the 11 months and in Grade 10–12 each learner paid R450 per month for 11 months (January–November).

The School Governing Body (SGB) exempted a total of 8 learners in Grade 12 from paying school fees for the 2015 year. The exempted learners were in the ratio boys : girls = 1 : 3.

At the April meeting of the SGB it resolved to increase the fees for Grade 8 and 9 by 5% and reduce the Grade 10–12 fees by 2,5%. The adjustments were effective from May 2015.

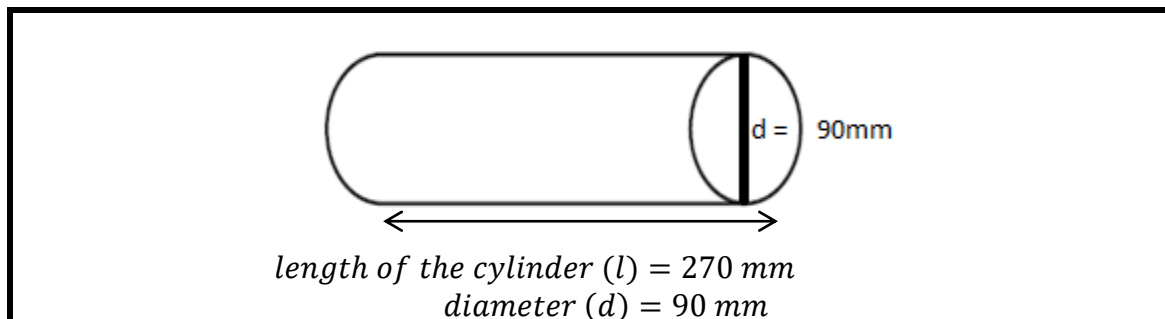
- 1.1 Determine the total school fees collected in January 2015 if all parents paid. (4)
- 1.2 Calculate the total school fees of the girls who were exempted would have paid in January 2015. (2)
- 1.3 Determine the monthly school fees payable by each learner in the school after the SGB meeting in 2015. (4)
- 1.4 Calculate the total school fees that were collected in 2015 if no parent defaulted on payment. (4)
- 1.5 An amount of R150 000 from the collected school fees in 2015 was invested in a fixed account with FNB. The investment attracts a simple interest rate of 9,5% per annum for the period January to December 2016. Work out the interest the school will earn from the investment. (2)
- 1.6 Calculate the value of **A**, the number of boys in Grade 11. (2)
- 1.7 Determine the probability of randomly selecting a Grade 11 learner from the school. Give your answer as a decimal. (2)

[20]

QUESTION 2

Thabo bakes round biscuits known as-Rb for sale. He packs the biscuits in a cylindrical container made up of cardboard material. The diagram below shows the container and its dimensions.

The diagram not drawn to scale.



The following formulae may be used in answering the questions that follow.

Area of the circle = πr^2 , where $\pi = 3,142$

Total surface area = $2\pi r^2 + 2\pi l r$

Volume of the cylinder = $\pi r^2 l$

2.1.1 Calculate the total surface area of the cardboard package required to make one cylindrical container. (4)

2.1.2 The rectangular cardboard used to make the cylindrical containers, is bought at a price of R5 a piece measuring 120 cm by 60 cm.
Work out the area of the rectangular cardboard in mm^2 . (3)

2.1.3 Use your answers in QUESTIONS 2.1.1 and 2.1.2 to determine the number of cylindrical containers that can be made from one piece of the cardboard. (3)

2.2 Thabo discovered that his tap was faulty and has been leaking water drops at a rate of one drop every 2 seconds. The water that was wasted, was a litre every 4 hours.

Note: 1 kl = 1 000 l; 1 l = 1 000 ml; 1 l = 1 000 000 microlitres.

2.2.1 Calculate the number of drops of water that filled a litre container.
Use the formula:
Number of drops = $\frac{\text{Seconds in 1 hour} \times \text{no. of hours}}{\text{rate of the drops}}$ (3)

2.2.2 Calculate the volume of one drop of water in microlitres. (2)

2.2.3 Work out the amount of water wasted from 01/01/2016 to 31/05/2016. Give your answer in litres. (3)

[18]

QUESTION 3

- 3.1 The floor plan of a house on sale in Johannesburg is shown on **ANNEXURE A**. Study the floor plan and the information given to answer the questions that follow.

$$1' = 30,48 \text{ cm}$$

$$1'' = 2,54 \text{ cm}$$

- 3.1.1 Determine the total number of doors that can be seen on the floor plan. (2)
- 3.1.2 Give the general direction of the bedroom measuring $11' \times 10'4''$ from the porch. (2)
- 3.1.3 Calculate the dimensions of the bedroom measuring $11' \times 10'8''$ in metres. (4)
- 3.1.4 The floor plan was drawn using a scale of 1,5 cm on the floor plan to represent 3,375 m on the actual building. Determine the scale used in the form of **1 : ...** (3)
- 3.2 Use Tables 1 and 2 in **ANNEXURE B** to answer the following questions.
- 3.2.1 Mr Dan departed on Friday from East London to meet an agent in Johannesburg on Saturday at 11:15 am as per arrangement. Write down the departure time from East London and arrival time in Johannesburg. (2)
- 3.2.2 Identify the station where Shosholoza-Meyl train stopped for the longest duration. (2)
- 3.2.3 The total time spent at the stations during the journey was 3 hours and 33 minutes. Calculate the average speed of the journey (East London–Johannesburg). Give your answer in Km/h.

You may use the following formula:

$$\text{Average speed} = \frac{\text{distance}}{\text{time}}$$

$$\text{Time} =$$

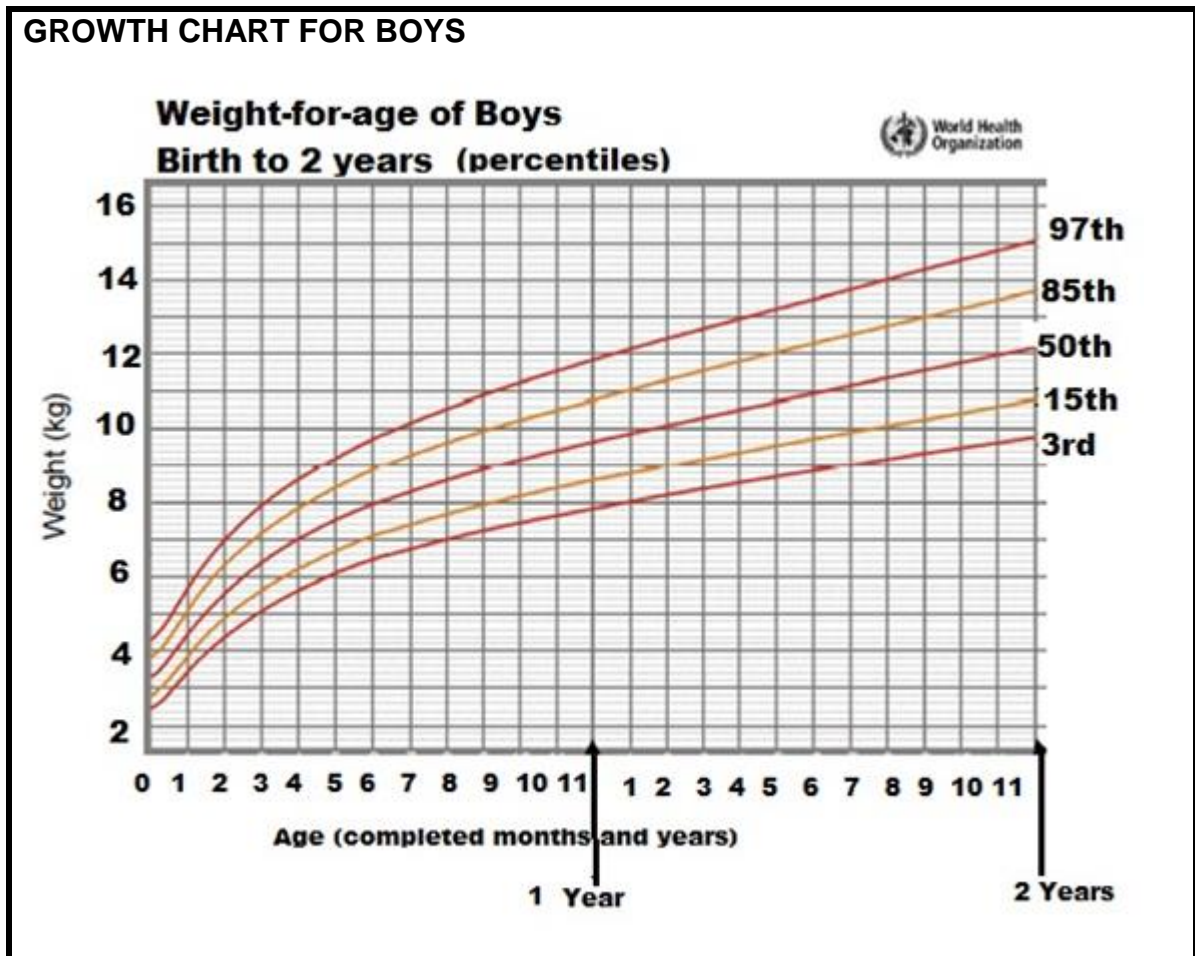
$$\frac{\text{Difference between arrival time and departure time}}{\text{total time spent at the stations}}$$

(4)

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QUESTION 4

- 4.1 The diagram below shows the Weight-for-age growth chart for boys from birth to 2 years. Use the growth chart to answer the questions that follow.



[Source: www.growthscharts.com]

- 4.1.1 Explain what it means if the baby's weight-for-age relationship is on the 85th percentile curve. (2)
- 4.1.2 Determine the weight of an 11-month-old baby whose weight-for-age relationship is on the 50th percentile curve. (2)
- 4.1.3 Consider a 18-month-old baby with a weight of 11 kg:
- On which percentile curve is this baby's weight-for-age relationship? (2)
 - Calculate the body mass index (BMI) for this baby if he is 80 centimetres tall.

Use the formula:
$$\text{BMI} = \frac{\text{Weight (in kilogram)}}{(\text{Height in metres})^2}$$
 (3)

- 4.2 The 2015 National Senior Certificate (NSC) results that was released showed a decrease in national achievement from 75,8% in 2014 to 70,7% in 2015. However there was an increase of 117 798 learners achieving a NSC qualification in 2015 compared to 2014.

TABLE 3 on **ANNEXURE C** shows the **2015 NSC ACHIEVEMENT BY TYPE OF QUALIFICATION**.

Use the information on **ANNEXURE C** to answer the following questions.

- 4.2.1 Calculate the total national number of learners that achieved a NSC qualification in the 2014 examinations. (2)
- 4.2.2 Determine the total national number of learners that did not achieve a NSC qualification in the 2015 NSC examinations. (2)
- 4.2.3 Calculate the value of **A**, the percentage of learners who qualified for admission to study for a Bachelors' degree in 2016. (2)
- 4.2.4 Show how the 23,0% for Diploma achievement for the Eastern Cape was calculated. (3)
- 4.2.5 Arrange the percentages (%) of the **overall** achievement of the provinces in ascending order and identify the province occupying the median position. (3)
- 4.2.6 Determine the probability of a learner from the Gauteng Province achieving a NSC qualification in 2015. Give your answer in a decimal form to 3 decimal places. (2)

[23]

QUESTION 5

- 5.1 Jane, a learner from Mambo SSS sells fat cakes her mother bakes at home.

South African Food: Fat Cakes

She calculated the cost of the ingredients that is needed to make one fat cake as follows:

INGREDIENT	COST
Bread flour	0,70
Sugar	0,75
Salt	0,05
Instant yeast	0,20
Water	0,05
Oil for deep frying	0,50

The mother is charging her R0,25 for labour for every fat cake sold. She sells each fat cake at R3,00 as a zero rated item. Jane hires a space at school for R50 per month from where she sells her fat cakes.

Use the above information to answer the following questions:

- 5.1.1 Calculate the variable cost for making one fat cake. (2)
- 5.1.2 The table below shows information for the income and expenses for fat cakes

TABLE 4: Income and expenditure for Jane's fat cakes

No. of fat cakes (n)	0	30	60	90	120	150
Total cost (R)	50	125	200	275	350	425
Income(R)	0	90	180	270	360	450

Use the information from the above TABLE to draw a straight line graph that represents the cost in **ANSWER SHEET 1**. (3)

- 5.1.3 Using the graph or otherwise determine the number of fat cakes she must sell to breakeven. (2)

- 5.2 Jane was chosen to visit Japan on a student entrepreneurship exchange programme during July holiday of 2016. She read from internet that the smallest form of the Japanese currency is a 1 yen coin. She exchanged R925 for Japanese yen.

Yen(¥) 1 = Rand (R) 0,13

Use the given exchange rate to determine how many yen (¥) she will receive from changing her Rand value

(2)

- 5.3 Mr Tawi is tired of renting and would like to buy a house in East London valued at R880 000 this year. The bank he approached offered him a home loan of R748 000. He was provided with a factor table as shown below to use in calculating his monthly repayment.

HOMELoAN REPAYMENT FACTOR TABLE

Term	Interest rates						
	7%	8%	9%	10%	11%	12%	13%
20 years	7,75	8,36	9,00	9,65	10,32	11,01	11,72
25 years	7,07	7,72	8,39	9,09	9,80	10,53	11,28
30 years	6,65	7,34	8,05	8,78	9,52	10,29	11,05

He decided to repay the loan over a 25 year period at an interest rate of 12% p.a. compounded monthly. Use the information and the above table to answer the questions that follow.

- 5.3.1 Determine his monthly repayment.
You may use the following formula:

$$\text{Monthly repayment} = \frac{\text{Amount granted}}{1\,000} \times \text{factor} \quad (2)$$

- 5.3.2 Calculate what the price for this house was in 2015 if the current inflation rate is 5,7% (3)

- 5.4 The results of the controlled test in March 2016 for the Grade 12 Mathematical Literacy learners at Mambo SSS are listed below:

38	54	20	61	60	21	31	54	65	76
48	60	5	22	63	17	15	66	54	59
73	31	98	26	42	67	8	5	46	54

Use the above table of results to answer the questions that follow.

- 5.4.1 Identify the mark that represents the mode of the class performance. (2)
- 5.4.2 Determine the range of the performance of this class. (2)
- 5.4.3 The Curriculum and Assessment Policy Statement (CAPS) has a seven point scale to rate a learner's performance as follows:

Rating Code	Description of competence	Percentage
7	Outstanding achievement	80%–100%
6	Meritorious achievement	70%–79%
5	Substantial achievement	60%–69%
4	Adequate achievement	50%–59%
3	Moderate achievement	40%–49%
2	Elementary achievement	30%–39%
1	Not achieved	0–29%

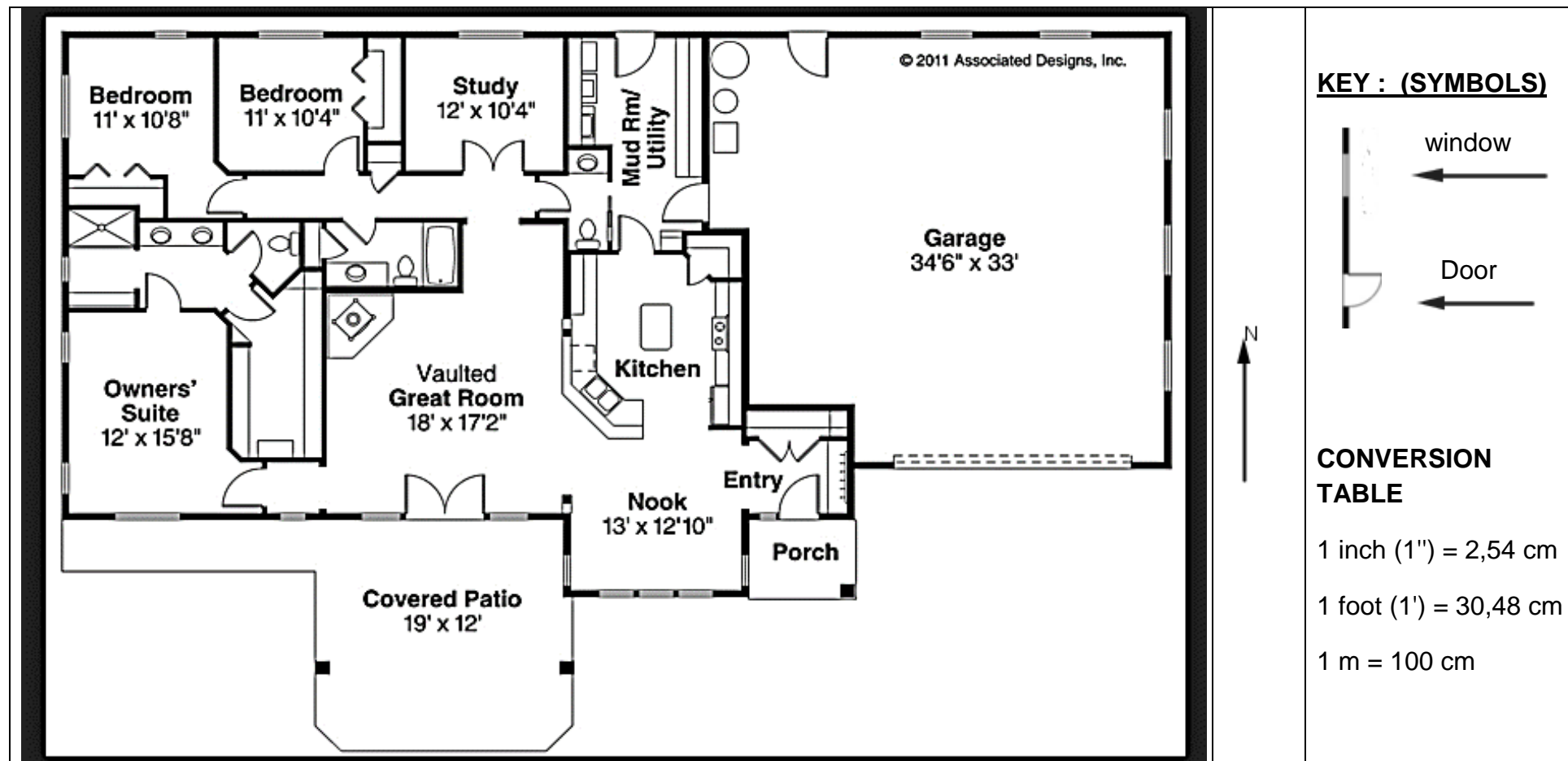
Determine the probability that a learner randomly chosen has obtained substantial achievement.

(2)
[20]

TOTAL: 100

ANNEXURE A: PLAN OF A HOUSE

QUESTION 3.1



ANNEXURE B: QUESTION 3.2

TABLE 1: *Shosholoza-Meyl* Train schedule

Johannesburg – East London (Wednesday, Friday and Sunday Service)					East London – Johannesburg (Wednesday, Friday and Sunday Service)				
Station	Class available	Day	Arr.	Dep.	Station	Class available	Day	Arr.	Dep.
Johannesburg	Sleeper/Sitter	Day 1		17:30	East London	Sleeper/Sitter	Day 1		09:00
Vereeniging	Sleeper/Sitter	Day 1	19:00	19:20	Queenstown	Sleeper/Sitter	Day 1	13:05	13:26
Kroonstad	Sleeper/Sitter	Day 1	21:42	21:50	Burgersdorp	Sleeper/Sitter	Day 1	16:00	18:28
Bloemfontein	Sleeper/Sitter	Day 2	00:32	00:55	Bloemfontein	Sleeper/Sitter	Day 1	21:36	21:56
Burgersdorp	Sleeper/Sitter	Day 2	06:17	06:34	Kroonstad	Sleeper/Sitter	Day 2	00:51	01:10
Queenstown	Sleeper/Sitter	Day 2	08:58	09:12	Vereeniging	Sleeper/Sitter	Day 2	03:20	03:25
East London	Sleeper/Sitter	Day 2	13:25		Johannesburg	Sleeper/Sitter	Day 2	05:00	

TABLE 2: Distances between the major towns:

The distances given below are for the shortest possible routes	
Town A to Town B	Distances (km)
Cape Town–Johannesburg	1 405
Cape Town–Durban	1 660
East London–Cape Town	1 042
Cape Town–Port Elizabeth	756
Cape Town–Bloemfontein	998
Cape Town–Upington	821
Johannesburg–Durban	598
East London– Johannesburg -	992
Johannesburg–Polokwane	331

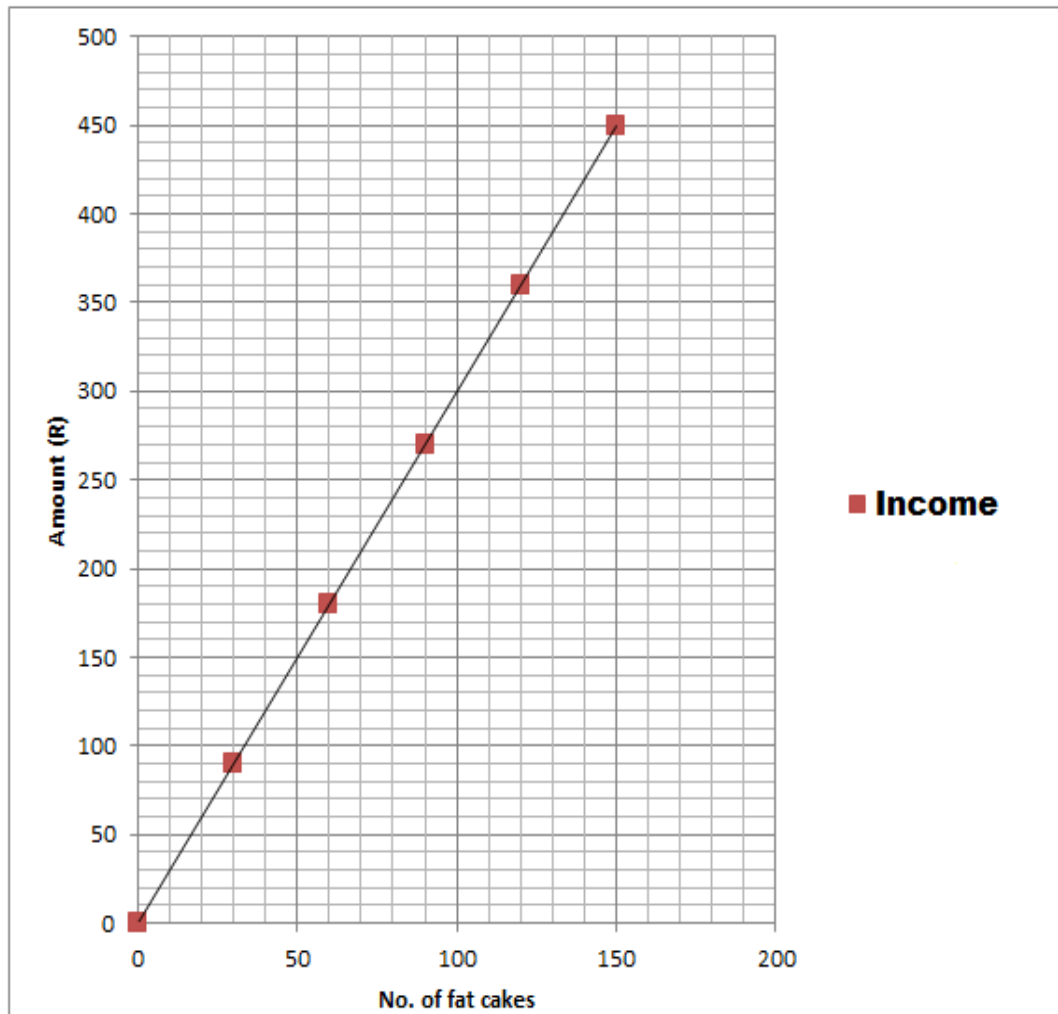
[Source: *Shosholoza-Meyl* route service]

NAME:

ANSWER SHEET 1

QUESTION 5.1.2

INCOME AND EXPENDITURE FOR JANE'S FAT CAKE SALES



ANNEXURE C

QUESTION 4.2

TABLE 3: 2015 NSC ACHIEVEMENT BY TYPE OF QUALIFICATION

PROVINCE	TOTAL WROTE	Bachelor		Diploma		Higher Certificate		Some information omitted		
		Achieved	% Achieved	Achieved	% Achieved	Achieved	% Achieved		TOTAL Achieved	% Achieved
EASTERN CAPE	87 090	15 291	17,6	20 055	23,0	14 119	16,2		49 475	56,8
FREE STATE	31 161	9 277	29,8	11 026	35,4	5 102	16,4		25 416	81,6
GAUTENG	108 442	38760	35,7	37 375	34,5	15 191	14,0		91 327	84,2
KWAZULU NATAL	162 658	34 751	21,4	39 799	24,5	24 180	14,9		98 761	60,7
LIMPOMPO	101 575	20 992	20,7	25 434	25,0	29 513	20,2		66 946	65,9
MPUMALANGA	54 980	13 497	24,5	18 675	34,0	11 046	20,1		43 229	78,6
NORTH WEST	33 286	8 865	26,6	11 554	34,7	6 699	20,1		27 118	81,5
NORTHERN CAPE	11 623	2 451	21,1	3 306	28,4	2 306	19,8		8 064	69,4
WESTERN CAPE	53 721	22 379	41,7	16 496	30,7	6 614	12,3		45 489	84,7
NATIONAL	644 536		A	183 720	28,5	105 770	16,4		455 825	70,7
[Source: National Senior Certificate Examination Report 2015: Technical Report 2015]										

