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Province of the
EASTERN CAPE
EDUCATION

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

SEPTEMBER 2016

MATHEMATICAL LITERACY P2

MARKS: 150

TIME: 3 hours



This question paper consists of 13 pages, which includes 2 ANSWER SHEETS
and an ADDENDUM of 1 page.

INSTRUCTIONS AND INFORMATION TO CANDIDATES

Read the following instructions carefully before answering the questions.

1. This question paper consists of FIVE questions. Answer ALL the questions.
2. Use the ADDENDUM for the following questions:

ADDENDUM A for QUESTION 5.2

ANSWER SHEET 1 for QUESTION 2.2.2

ANSWER SHEET 2 for QUESTIONS 4.2.4

Write your name in the spaces provided on the ANSWER SHEETS and hand in the ANSWER SHEETS with your 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. Round off ALL final answers appropriately accordingly to the given context, unless stated otherwise.
7. Start EACH question on a NEW page.
8. Write neatly and legibly.

QUESTION 1

Vuka Rentals is a flat rental company owning blocks of flats. Each block has 3 floors with 2 one bedroomed flats and 2 two bedroomed flats on each floor.

- Rent for the one bedroomed flats is R2 300 per month including water.
- For the two bedroomed flats the rent is R3 200 per month excluding water. The water is charged at 7,5% of the monthly rental.
- There are 8 blocks of flats altogether.

The maximum number of registered tenants are as follows:

- 2 persons for a one bedroomed flat, and
- 4 persons for a two bedroomed flat.

- 1.1 Determine the total number of each type of flats. (2)
- 1.2 Calculate the total income if all the flats are rented out. (4)
- 1.3 Glenn is a University student from Ghana renting a one bedroomed flat. He received a birthday present of 415 Ghanaian Cedi from a friend. If he uses the money for paying his rent, how much more does he need to cover one month's rent (rounded off to the nearest rand) given that 1 Ghanaian Cedi = 3,77 South African Rand. (4)
- 1.4 If the occupancy of the two bedroom flats decrease to 93,75% and the one bedroom flats remain at 100%, calculate the amount that Vuka rentals lost. (4)
- 1.5 If there are in all 8 blocks 37,5% adults, how many children are in these flats? (5)
- 1.6 The blocks of flats are numbered from BLOCK A to BLOCK H, while the flats have numerical values. Calculate the probability that the number of a flat will be C1. (2)

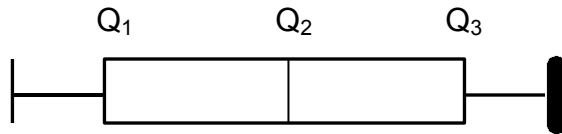
[21]

QUESTION 2

2.1

Class results for a Mathematical Literacy P1 trial exam are as follow:

65 79 **A** 98 **B** 68 90 76 84 102 132 121 **B** **B**



Note: B represent the same value for some candidates and is not the highest mark.

- 2.1.1 Given that the range of these results is 78. Calculate the value of **A**, which is the minimum value. (3)
- 2.1.2 The mean for the set of data is 90. Calculate the modal value. (4)
- 2.1.3 Calculate the missing values (**Q₁**; **Q₂** and **Q₃**) in the box and whisker diagram. (6)
- 2.1.4 For the same class the mean of the results in Mathematical Literacy P2 is 75. Compare and comment on the mean of the two papers. (2)
- 2.1.5 Determine the probability that a learner will be in the bottom 25%. (2)

2.2

Lucy is a teacher who is organising a matric farewell at a certain high school. She goes to two venues and is given two separate prices which are outlined as follows:

Venue A:

Venue booking	:	R1 500
Catering cost per person	:	R150
Disc Jockey (DJ)	:	R1 200

Venue B:

Venue booking (including DJ)	:	R1 300
Catering cost per person	:	R220

There will be 55 learners, 10 teachers and a guest speaker who will attend the farewell.

- 2.2.1 Calculate the difference between the total costs for the rent of the two venues with the maximum number of people attending the matric farewell. (5)
- 2.2.2 In ANSWER SHEET 1, a line graph is drawn showing the cost of venue A for learners only. On the same set of axes, draw a line graph showing the cost of venue B, for learners only. (6)
- 2.2.3 Explain the meaning of the breakeven point in this context and write its values according to the graph. (3)

[31]**QUESTION 3**

- 3.1 A 45 year old Sivu is earning R368 450 per annum. He contributes monthly to a medical aid scheme for himself and two dependants.

2015/2016 Tax Year (1 March 2015 to 29 February 2016)

TAXABLE INCOME (R)	RATES OF TAX (R)
0 – 181 900	18% of each R1
181 901 – 284 100	32 742 + 26% of the amount above 181 900
284 101 – 393 200	59 314 + 31% of the amount above 284 100
393 201 – 550 100	93 135 + 36% of the amount above 393 200
550 101 – 701 300	149 619 + 39% of the amount above 550 100
701 301 and above	208 587 + 41% of the amount above 701 300

Tax thresholds applicable to individuals	Amount
Persons under 65 years	R3 650
Persons 65 years and older	R114 800
Persons 75 years and older	R128 500

Medical aid credits (monthly contributions)	Amount
Tax payer	R270
First dependant	R270
Additional dependants	R181

- 3.1.1 Calculate his monthly tax as a percentage of his monthly income by using the tax table provided. (8)

- 3.1.2 With the necessary calculations, explain how his tax payable would be influenced if he was 78 years old and earning the same amount of money. (3)

- 3.1.3 He has R30 704,17 to invest for 3 years. He has to choose between two options.

Option1: Invest at an institution that offers 6,9% simple interest per annum

OR

Option 2: Invest at a bank that offers an interest rate of 6% per annum, yearly compounded

Show with the necessary calculation to advise him which option is the best for him. (8)

- 3.2 Sivu needs a new geyser for his flat. He finds two geysers advertised as follows.

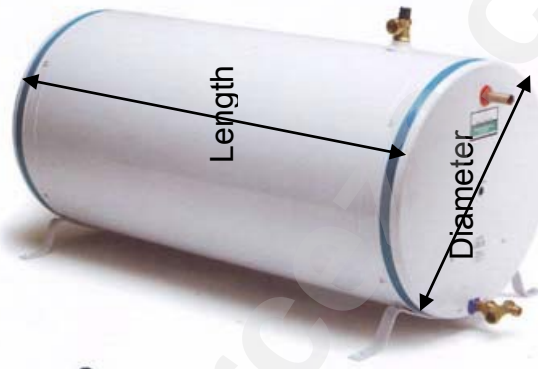
Model	Diameter $\times$ length
50 ℓ	450 mm $\times$ 610 mm
100 ℓ	550 mm $\times$ 840 mm

You may use the following formula:

$$\text{Surface area} = (2 \times \pi \times \text{radius} \times \text{length}) + (\pi \times \text{radius}^2 \times 2)$$

Where $\pi = 3,142$

The geyser is illustrated below and is not drawn to scale.



- 3.2.1 Sivu claims that if one geyser's volume is double the other, the surface area should also be doubled. By using the formula, prove that Sivu's claim is valid or not. (8)
- 3.2.2 If the geyser drawn above is the 100 ℓ -model as advertised, write the scale used to draw the length of the geyser in the form 1 : ... (3)

[30]

QUESTION 4

- 4.1 An American family, Mr. and Mrs. Jones is visiting friends in Johannesburg. Whilst in Johannesburg they get information about the wild coast and decide to book a holiday at Kei mouth in the Eastern Cape Province.

At Kei mouth you can take a ferry through the Kei River to Qolora for fishing which is 10 km from the Kei mouth.

INFORMATION:

- Hiring costs for a motor vehicle at Avis in East London is R2 800 for the weekend
- Accommodation at one of the resorts in Kei mouth is R543 per night per person sharing (check in Friday, check out Monday)
- Kei mouth ferry – Transports motor vehicles and people across the river at R70 per motor vehicle for a single trip

This service does not operate when the river is in flood.



NB: Distance between East London and Kei mouth is 86 km.

- 4.1.1 They arrived at the airport at 08:00 and they spend 3 hours and 45 minutes in East London. They travelled to Kei mouth at an average speed of 90 kilometers per hour.

Show by using calculations whether they will arrive on time to have lunch at 12:30 at Kei Mouth.

You may use the formula: **Average speed** = $\frac{\text{distance travelled}}{\text{time taken}}$ (6)

- 4.1.2 If they hire a car from Avis and decide to go for fishing in Qolora for two days, they will need to use the ferry to and from Qolora during those two days. They feel that 700 American dollars will be enough to cover the hiring, accommodation and ferry rides. Use calculations to support this statement if the exchange rate during their vacation is 1 American dollar (\$) = 14,391 South African rand. (6)

- 4.1.3 There is a warning that when the river is in flood, there will be no ferry rides. What is the reason for this? (2)

4.2

Mr. Jones studied a South African table showing the births and Aids related deaths for the period 2002 to 2014.

Year	Number of births	Total number of deaths	Total number of Aids related deaths	Percentage Aids related deaths
2002	1 111 987	631 383	275 444	43,6
2003	1 117 024	667 902	313 477	46,9
2004	1 201 172	697 473	344 141	49,3
2005	1 122 148	716 083	363 910	50,8
2006	1 125 755	694 227	343 194	49,4
2007	1 132 500	647 827	297 659	45,9
2008	1 141 468	617 202	257 504	41,7
2009	1 152 319	590 322	228 051	38,6
2010	1 163 629	578 953	213 864	36,9
2011	1 173 164	580 460	211 839	36,5
2012	1 184 867	575 546	203 293	35,3
2013	1 196 395	565 310	189 376	33,5
2014	1 207 711	551 389	171 733	31,1

- 4.2.1 What is the trend in the percentage Aids related deaths from 2007 to 2014? Give TWO possible reasons for the trend observed. (4)
- 4.2.2 Calculate the difference in the total number of births and the total number of Aids related deaths from 2006 to 2014. (4)
- 4.2.3 Sinakho claims that the percentage increase in the number of births between 2013 and 2014 is more than 1,5%. Show with the necessary calculations whether the claim is valid or not. (4)
- 4.2.4 Draw a bar graph to represent the percentage Aids related deaths. Use ANSWER SHEET 2 to illustrate 2002, 2005, 2007, 2009 and 2014. (5)

[31]

QUESTION 5

- 5.1 Avela is a carpenter who is starting a small business. He builds free standing cupboards as shown in the picture (cupboards are not drawn to scale).

A picture of an already painted cabinet



Cupboards dimensions:

Front: Length 80 cm × Width 72 cm
 Back: Length 80 cm × Width 72 cm
 Sides: Length 72 cm × Width 54 cm
 Doors: Length 71,6 cm × Width 39,7 cm
 Top: Length 78 cm × Width 60 cm
 Bottom: Length 71,6 cm × Width 54 cm

Materials used:

Sides	Melamine whiteboard 1 830 mm × 2 700 mm at R390 per board.
Back	Masonite 1 200 mm × 2 200 mm at R90 per board
Doors	Black cherry board (dimensions same as melamine whiteboard but price is R150 more than melamine)
Bottom	Melamine white (same as sides)
Top	Black slate 3 400 mm × 600 mm at R800 per board

Price of all material excludes VAT (VAT: 14%)

- 5.1.1 Give a reason why the dimensions for the doors are less than those for the front side of the cupboard. (2)
- 5.1.2 If he makes 10 cabinets, how many boards of each material will he need? (10)
- 5.1.3 Avela has budgeted R6 000 to buy the material including VAT. Use calculations to prove whether his budget will be enough. (6)
- 5.1.4 He temporarily stores his cupboards in a storeroom which is 3 m × 4 m. With calculations show whether the space will be enough to store the 10 cupboards (cupboards are not stored on top of each other). (4)

- 5.2 ADDENDUM A shows a seating plan of a theatre in London. Study the

seating plan and answer the questions that follow.

- 5.2.1 On a particular performance, the theater was $\frac{1}{3}$ full excluding 2 wheelchair seats. Information collected on this day was that the ratio of men to women was 2 : 3. How many men attended on this particular day? (3)
- 5.2.2 Yolanda is on holiday in London and wants to book a ticket for a show at the theater. She is going with a wheelchair bound friend who needs to sit next to her. She wants a chair which is on the left hand side of the stage when entering through Door 3. Write down all the possible row and chair numbers that she can choose. (She is not selective about the distance from the stage). (3)
- 5.2.3 What is the probability of getting seat no 25 or 24 in this theatre? Write your final answer to 3 decimal places. (3)
- 5.2.4 A couple books tickets and are told that the only two available seats which can accommodate them sitting next to each other, are on the right-hand side of the stage if they enter through Door 1, on the 12th row from the stage and in second and third position on that side. Give clear directions for this couple to their seats if they enter the theatre through Door 4 and mention their seat numbers. (3)
- 5.2.5 Two people coming to watch a play in the theatre, one is farsighted and the other shortsighted. The only available seats are D11 and T12. Suggest with reasons which seat is suitable for each of these persons. (3)

[37]

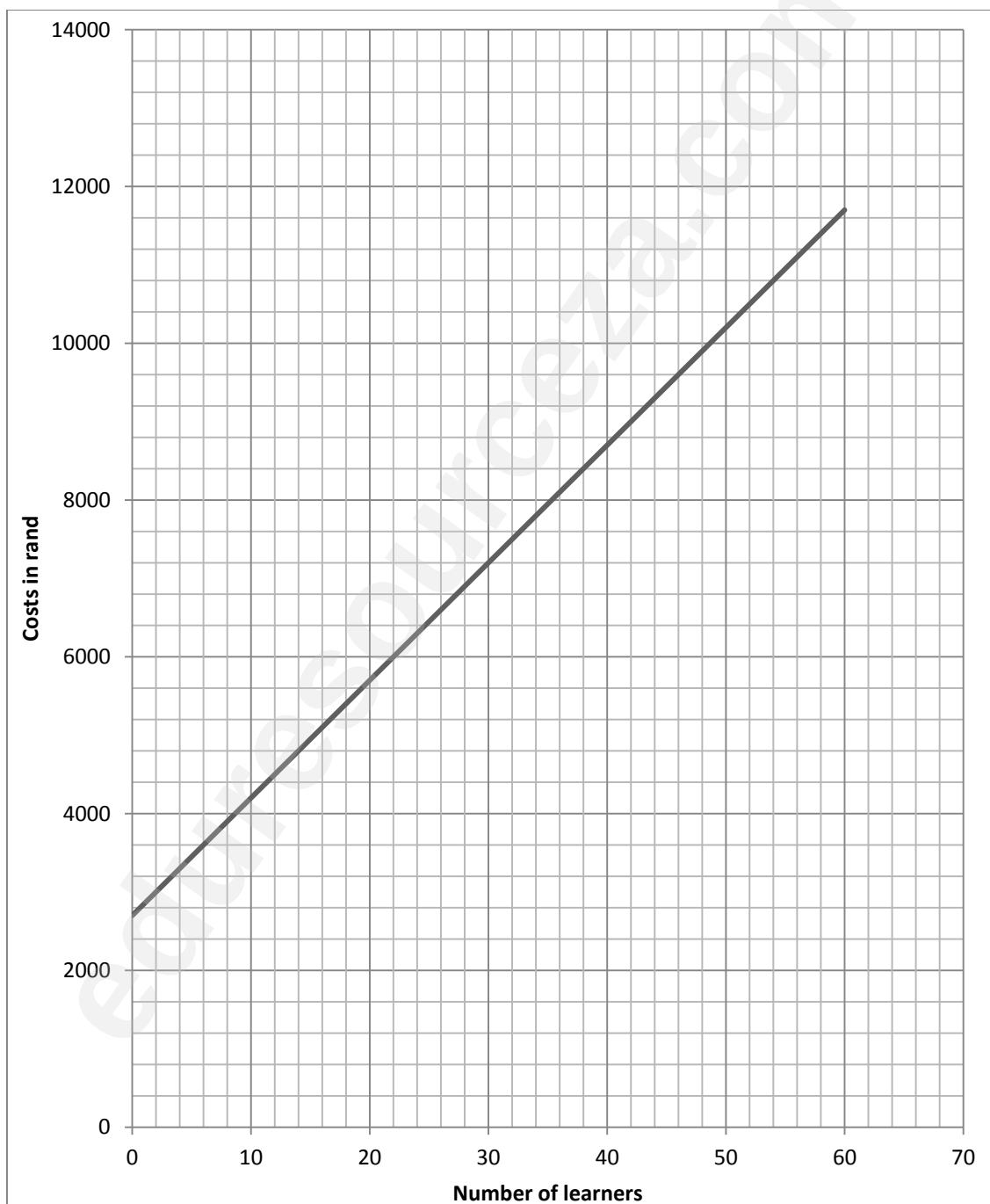
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ANSWER SHEET 1

NAME:

GRADE 12:

Graph to show costs of venues with different number of learners



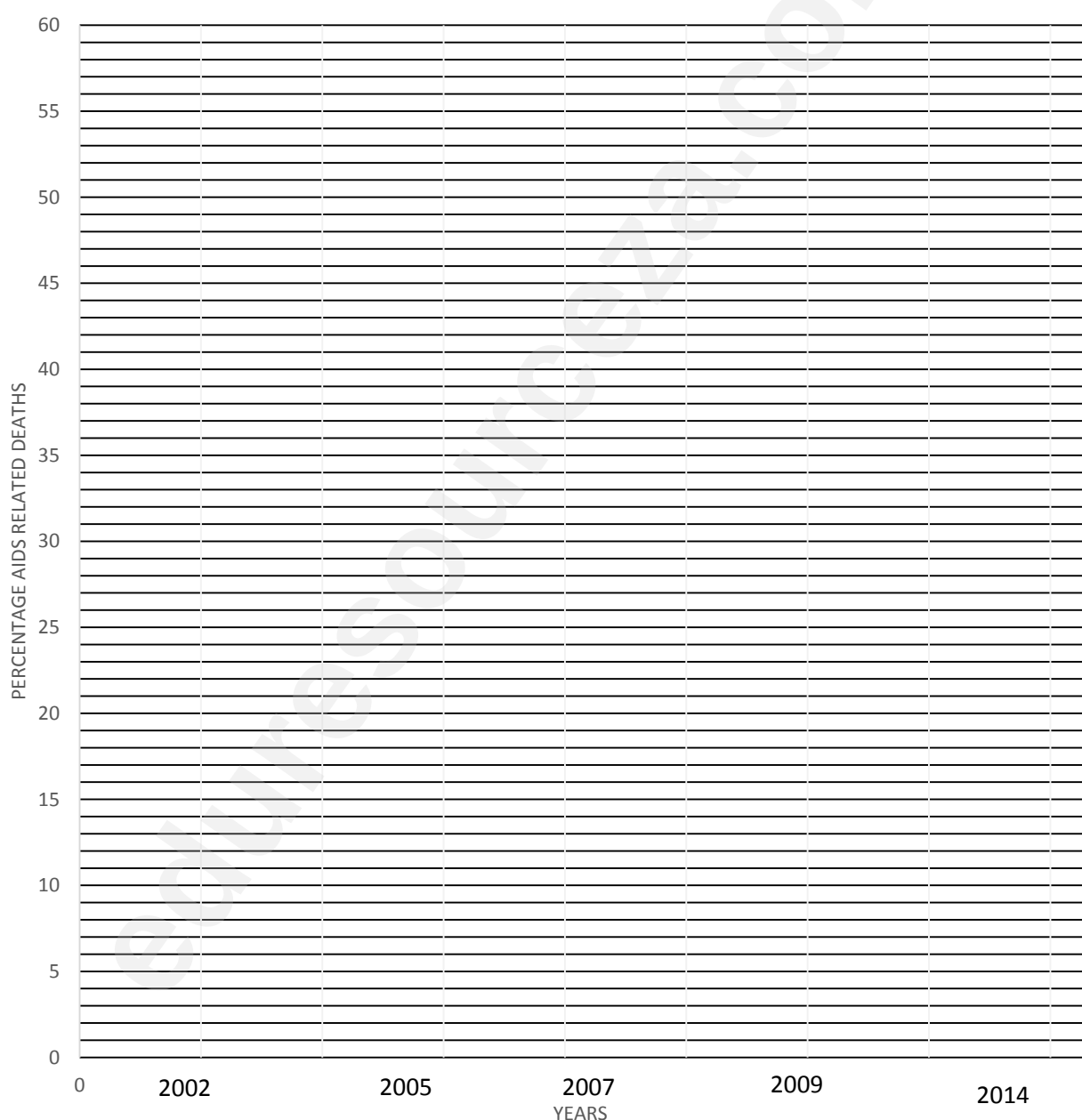
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ANSWER SHEET 2

NAME:

GRADE 12:

Bar graph to show percentage Aids related deaths over a period of years



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ADDENDUM A

THE THEATRE

Door 1

Door 2

N

Stage

[illegible]

DOOR 4

Wheelchair

DOOR 3

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