GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

GAUTENG DEPARTMENT OF EDUCATION

PREPARATORY EXAMINATION

2016

10601

MATHEMATICAL LITERACY

FIRST PAPER

TIME: **3 hours**

MARKS: **150**

14 pages + 1 answer sheet and an addendum with 3 annexures

MATHEMATICAL LITERACY: Paper 1
1060E
10601E

X05

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(First Paper)

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INSTRUCTIONS AND INFORMATION

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

2. Use the ADDENDUM as follows:

   - Use ANNEXURE A to answer Question 1
   - Use ANNEXURE B to answer Question 1.1.3
   - Use ANNEXURE C to answer Question 2.4

3. Use the ANSWER SHEET at the end of your question paper to answer Question 4.4.1.

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

5. Start the answers to each question on a NEW page.

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

7. Show ALL calculations clearly.

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

9. Indicate units of measurement, where applicable.

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

11. Write neatly and legibly.

QUESTION 1

1.1

Robert is the HR Officer of Bettie's Best Boutique and Mrs. April is a 48-year-old sales manager who is a single mother with one child. Robert is preparing Mrs. April's payslip for the month of October 2015. The total contribution towards the Unemployment Insurance Fund (UIF) is 1% of the employee's Gross Salary and a matching 1% from the employer. **Annexure A** contains Mrs. April's payslip for October 2015 and **Annexure B** contains the tax table for individuals for the tax year 2015/2016.

Use the information from Mrs. April's payslip on ANNEXURE A and the tax table on ANNEXURE B to answer the questions that follow.

1.1.1 Calculate the value of **A**. (2)

1.1.2 Calculate Mrs. April's annual taxable income.

Use the formula:

Taxable income = Annual income – Annual Pension Fund contribution (4)

1.1.3 (a) Medical Tax credits are deducted from the annual tax payable to determine the tax she needs to pay. Calculate the annual medical tax credits that she can deduct from her annual tax payable. (2)

(b) Use the 2015/2016 tax table provided on ANNEXURE B to calculate Mrs. April's annual tax payable.

Use the formula:

Annual Tax Payable = Annual Tax-Rebate-Medical Tax Credit (2)

(c) Determine the value of **B** on Mrs. April's payslip (ANNEXURE A). (2)

1.1.4 (a) Show that Mrs. April's total deductions amount to R3 803,45. (2)

(b) Determine, the value of **C** (ANNEXURE A), Mrs. April's nett monthly income.

Use the formula:

Nett Income = Gross Income – Total Deductions (2)

1.1.5 (a) Write down the percentage used to calculate Mrs. April's UIF (Unemployment Insurance Fund) contribution. (2)

(b) Determine the total amount of UIF to be paid over to SARS at the end of the month of October by Bettie's Best Boutique. (2)

1.1.6 Mrs. April is getting married in February 2016. She intends adding her future husband as a member of her medical aid scheme.
Determine her annual medical tax credit for the 2015/16 tax year. (2)

1.1.7 Mrs. April's child is in Grade 11 and intends to enrol for further studies after matric. To be able to have her child registered for the first year of study, Mrs. April decided to save R3 000 per month starting from the end of November 2014 to November 2015. The total amount at the end of November 2015 was then invested in a bank offering her a 32-day Call Account at 3,4% simple interest per annum.

(a) Determine the total amount saved after one year. (1)

(b) Hence, calculate the amount that Mrs. April will have in her account at the end of November 2016. (2)

1.2

During the December holiday, Mrs. April was involved in a road accident on her way back to Johannesburg from Port Elizabeth. The insurance company informed her that her vehicle was damaged beyond repair. Mrs. April decided to replace the vehicle. She saw the advertisement below in a local newspaper.



Mrs. April was offered a hire purchase agreement from Brothers Bank. She was offered two options:

Option 1	**Option 2**
Deposit: R10 500	No Deposit required
Term: 5 years	Term: 5 years
Interest: 10,5% compounded bi-annually	Interest: 12% compounded annually
Admin fee: R1 010	Admin fee: R1 010
Registration/Licence: R788	Registration/Licence: R788

Use the information above to answer the following questions.

1.2.1 Calculate the amount to be financed by Mrs. April if she decided to choose Option 1. (3)

1.2.2 Calculate the amount that Mrs. April will owe the bank after two years on Option 2, without any payments made towards the hire purchase account. (5)

1.2.3 Determine the deposit as a percentage of the purchase price. (4)

1.3

Mrs. April is concerned about the impact that the projected inflation rate and increase in municipal rates and fees will have on her disposable income. **Table 1** below shows the increased projected tariffs.

Table 1: Increase in tariffs for 2017

Rates and services charged	2016	% increase	2017
Refuse removal	R140,00	**A**	R157,50
Sanitation	R179,39	13%	R202,71
Water consumption	R170,86	10,5%	R188,80
Electricity consumption (non-prepaid)	R584,79	14,3%	R668,41
Property rates	R380,98	15%	R438,13
Subtotal excluding VAT	**B**		R1 655,55
VAT on services	R203,84		R231,78
Total	**R1 668,86**		**R1 887,33**

Use the information above to answer the questions that follow.

1.3.1 Explain the meaning of *interest rate*. (2)

1.3.2 Determine the value of **A**, the percentage increase for refuse removal. Use the formula:

$$\textbf{Percentage increase} = \frac{\textbf{New amount - Old amount}}{\textbf{Old amount}} \times \textbf{100 \%}$$ (3)

1.3.3 Determine the value of **B**. (2)

1.3.4 Through calculations show how the VAT amount of R231,78 was calculated. (2)

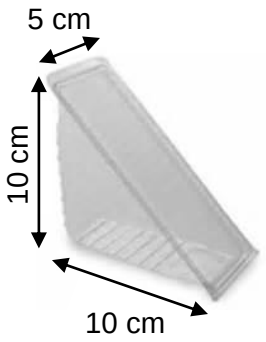
1.3.5 Calculate the additional amount per month for which Mrs. April will have to budget, on her municipal account for 2017. (2)

[48]

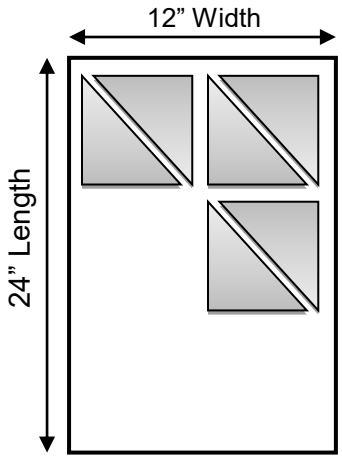
QUESTION 2

2.1

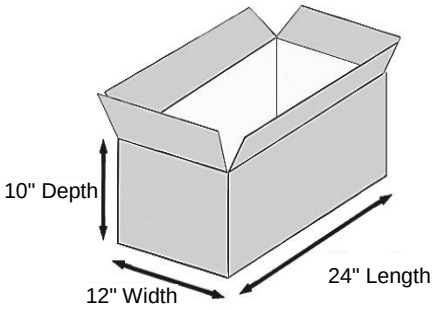
Parents at Kings Primary School are part of the feeding scheme at the school. They prepare sandwiches for the less fortunate learners and hand the sandwiches out at break time. The sandwiches are packed in triangular plastic containers and then stacked in pairs on the slant sides of the triangular containers into a cardboard box as shown below.



Measurements:
Length = 10 cm
Width = 10 cm
Depth = 5 cm



Packaging as seen from above



Measurements:
Length = 24 inches
Width = 12 inches
Depth = 10 inches

1 inch = 2,54 cm

Volume = Length × Width × Depth

Use the information above to answer the questions that follow.

2.1.1 (a) Convert the length, width and depth of the cardboard box to **cm.** (4)

(b) Calculate the volume of the cardboard box in **cm^3.** (2)

2.1.2 Determine how many plastic containers can fit into ...

(a) the length of the cardboard box. (3)

(b) the width of the cardboard box. (2)

2.1.3 If a total of 144 triangular plastic containers can fit into one cardboard box, calculate how many boxes will be needed if 1 500 learners in the school participate in the feeding scheme. (2)

2.2 When preparing the sandwiches, parents randomly put three spreads on the sandwiches: Sandwich Spread, Cheese Spread and Marmite. A box was randomly chosen and the spreads on the sandwiches were found to be in the following ratio: 5 Sandwich Spread, 59 Marmite and 80 Cheese Spread sandwiches.

2.2.1 Write down the ratio of Cheese Spread sandwiches to Sandwich Spread sandwiches in the simplest form. (2)

2.2.2 Write down the probability (as a percentage) of a learner getting a Sandwich Spread sandwich. (3)

2.3 Mrs. Madiba, one of the parents, needs to deliver the sandwiches to Kings Primary School. The school is 25,3 km from Mrs. Madiba's home. It takes her 45 minutes to reach the school. If Mrs. Madiba leaves her home at 10:50, at what time will she reach the school? (2)

2.4 Mrs. Madiba is concerned about her daughter's general health and takes her to the local clinic to be examined. Her daughter, Suzy, is 12 years old, 150 cm tall and has a body-mass-index of 27 kg/m^2. The nurse at the clinic provides her with a BMI (Body-Mass-Index) chart (ANNEXURE C).

Use the information above and ANNEXURE C to answer the questions that follow.

2.4.1 Write down the percentile into which Mrs. Madiba's daughter falls. (2)

2.4.2 Mrs. Madiba told the nurse that she is concerned that her daughter is overweight for her age and height. Substantiate Mrs. Madiba's opinion by calculations.

Use the formula: $$\textbf{BMI} = \frac{\textbf{Mass (kg)}}{\textbf{(Length in m)}^2}$$ (5)

2.4.3 Suzy needs to lose weight. If she loses enough weight to fall into the 85th percentile, write down her new BMI. (2)

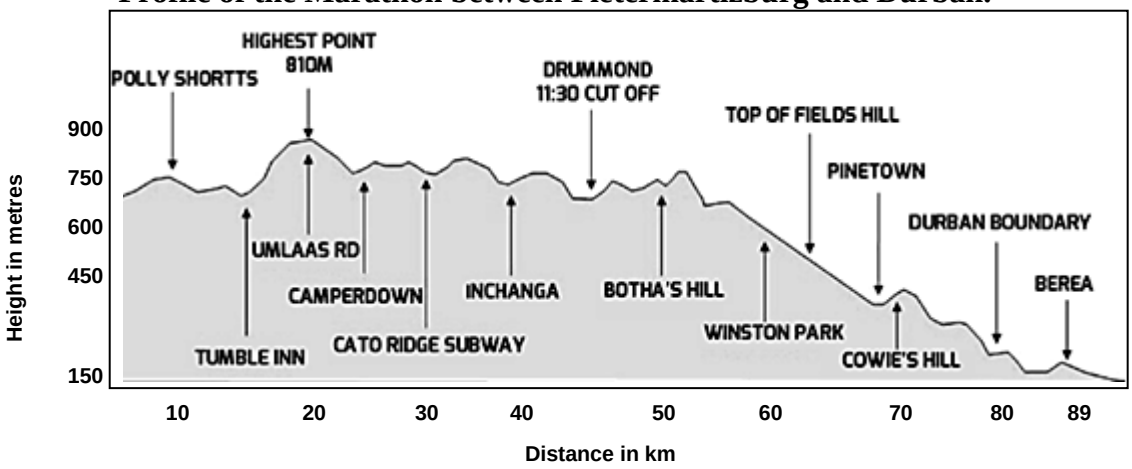
[29]

QUESTION 3

3.1

The Comrades Marathon is an ultra-marathon run between Durban and Pietermaritzburg. The race starts at 05:30 and finishes at 17:30.

Profile of the Marathon between Pietermartizburg and Durban.



[Source: www.crescentsofbrisbane.org]

Use the information above to answer the questions that follow.

3.1.1 Write down the total distance of the Comrades Marathon. (2)

3.1.2 A cut-off point is a certain point which the runners must reach within a prescribed time so that they may continue their participation in the Comrades Marathon.

(a) Write down the cut-off point and time for the marathon runners. (2)

(b) Write down the approximate distance from the cut-off point to the end of the marathon. (1)

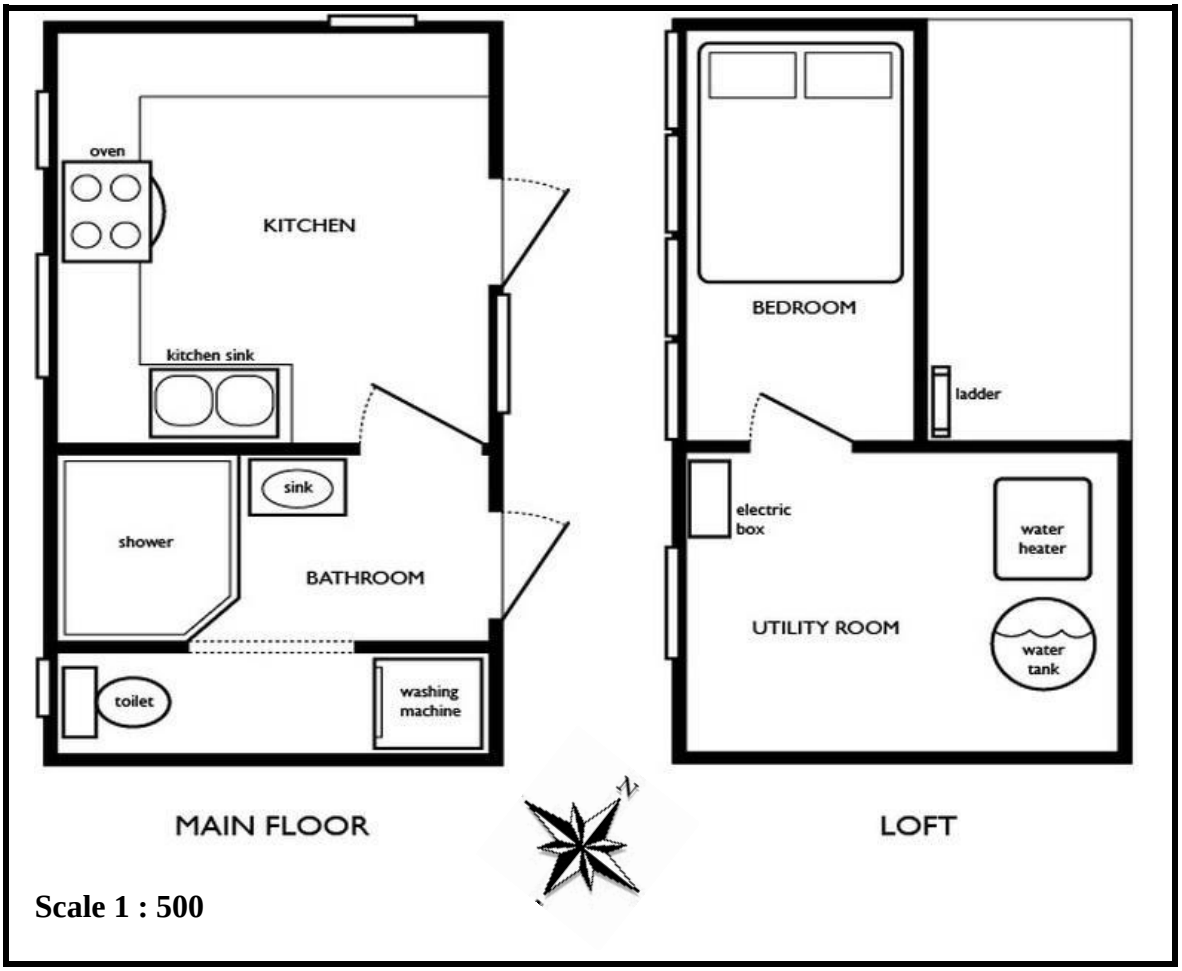
3.1.3 Write down the two points between which the steepest downhill slope lies, when the marathon will be run downhill. (2)

3.1.4 Tebogo participated in the Comrades Marathon and finished the marathon in a time of six and a half hours. Calculate Tebogo's average speed in km/h.

Use the formula: $\textbf{Average Speed} = \dfrac{\textbf{Distance}}{\textbf{Time}}$ (2)

3.1.5 Describe in detail the marathon from Drummond to Pinetown, as indicated on the map. Use words like uphill, downhill, slope and steep. (5)

3.2 Study the floor plan of the house below and answer the questions that follow.



Use the floor plan above to answer the following questions.

3.2.1 Identify the scale of the floor plan. (2)

3.2.2 Explain what the scale means in terms of the measurements on the plan and actual dimensions. (2)

3.2.3 Measure the South-Western wall of the house. Give your answer in **cm**. (2)
[20]

QUESTION 4

4.1

In 2015 a group of female friends decided to enter the Cape Argus Pick-n-Pay Cycle Tour as a team. They decided to call their team *The Seasonal Fruits*. Each member chose their favourite fruit and dressed in the bright colours of the fruit that each had chosen, on the day of the cycle tour. The team enjoyed the experience and decided to enter the cycle tour again in 2016. **Table 2** below is a summary of the times in which each member of the team completed the tour in 2015 and 2016.

Table 2: Time taken to complete the tour in 2015 and 2016

Age in 2015	Time (2015)	Age in 2016	Time (2016)
18	03:47:43	19	03:13:22
17	04:10:30	18	Injury
17	03:57:16	18	04:25:14
16	04:01:27	17	03:39:45
18	03:38:10	19	04:26:51
17	05:05:35	18	03:44:49
18	04:52:00	19	Injury
20	04:52:00	21	03:56:38
25	05:38:01	26	Injury
25	05:28:36	26	06:05:10
		26	05:33:43
		29	06:11:59

Use the information from the table above to answer the following questions.

4.1.1 Write down the total number of team members belonging to *The Seasonal Fruits* for 2016. (2)

4.1.2 Write down the maximum time that it took for a member of *The Seasonal Fruits* team to complete the tour in 2016. (2)

4.1.3 Determine the time range for members in 2015. (2)

4.1.4 Calculate the mean age of the team members that participated in the tour in 2015. (3)

4.2 The 2015 and 2016 times for *The Seasonal Fruits*, rounded to the nearest minute, are shown below.

2015	306	292	250	228	338	329	281	237	251	292
2016	193	220	225	237	265	267	334	265	372	

4.2.1 Write down the mode for the 2015 times. (1)

4.2.2 Calculate the mean time for 2016. Give your answer in hours and minutes. (3)

4.2.3 Determine the median time for 2015. (3)

4.2.4 Determine the range for 2016. (2)

4.3 4.3.1 Determine whether the following sample is representative or biased:
"A researcher stands in front of the community library to ask whether the people passing through have read a book in the past month." (2)

4.3.2 Explain the meanings of the following terms.

(a) Discrete data (2)

(b) Continuous data (2)

4.4 Mrs Morake keeps a record of her sales of mats at her flea market stall for six days of trading. She sells the mats for R25.00 making a profit of R8.00 on each sale. She sold 26 mats during the six days. Below is a record of the income from her sales.

Day of the week	Mon	Tues	Wed	Thurs	Fri	Sat
Amount earned	50	100	75	100	150	175

4.4.1 Draw a line graph on the ANSWER SHEET to represent this information. (6)

4.4.2 Calculate the profit she made after trading for six days. (3)

4.4.3 Write down the days on which she received the same income. (2)

[35]

QUESTION 5

5.1

The South African Demographic and Health Survey was carried out in 1998. As a part of the survey, 5 671 men were surveyed about their alcohol drinking habits. Their respective blood pressure levels were measured and recorded. The results are summarized in **Table 3,** a contingency table.

Table 3: Blood pressure of men who participated in The South African Demographic and Health Survey on alcohol drinking habits.

Number of men	High blood pressure	Blood pressure not high	Total
Drink alcohol	688	1 864	2 552
Don't drink alcohol	611	2 508	3 119
Total	**1 299**	**4 372**	**5 671**

Use the information above to answer the questions that follow.

5.1.1 Write down the total number of men with high blood pressure. (1)

5.1.2 Write down the number of men who do not drink alcohol and who do not have high blood pressure. (1)

5.1.3 Determine the ratio of men drinking alcohol who had high blood pressure. Round your answer off to the nearest whole number. (2)

5.1.4 If you choose a male non-alcoholic drinker at random, what is the probability that he does not have high blood pressure? Give your answer as a common fraction in its simplest form. (2)

5.2

Mr L Mohapi is a resident of Bergville. Below is an incomplete statement of his municipal account. Study the account and accompanying tariff structure and use the information to complete the account statement.

Bergville Municipality Water and Sewage Tariffs

Account Detail as at 10/09/2015	**A/c No 43247876**
Water (Period 06/07/2015 to 05/08/2015 – 31 Days) (Actual reading)	
At 41 Burnside Road, Bergville/ERF0087983	
Previous reading:	**(A)**_____
Current reading :	125334kl
Consumption :	34.5kl
Consumption charge (Dom 1)	**(B)**R_____
Sewage (Period 06/07/2015 to 05/08/2015 – 31 Days)(Actual reading)	
At 41 Burnside Road, Bergville/ERF0087983	
Disposal charge	**(C)**_____kl R181.60
VAT at 14%:	**(D)**R_____
LATEST ACCOUNT TOTAL DUE	R519,50_____

WATER			**SEWAGE**	
Domestic 1: Tariff			Disposal Charges	
Volume	Tariff (per kl)		Volume	Tariff (per kl)
≤6kl	Free		≤4kl	Free
6,1 – 15kl	R8.60		4,1kl – 7kl	R4.67
15,1 – 25kl	R9.60		7,1kl – 15	R9.94
>25kl	R10,60		>15kl	R14.60

Use the information above to calculate the missing values.

5.2.1 A (2)

5.2.2 B (3)

5.2.3 (a) Calculate the remaining amount of R181,60 for disposable charge after 15 kl of the sewage amount has been used. (3)

(b) Calculate the total number of kilolitres of sewage disposed of at the missing value C. (2)

5.2.4 If the consumption charge is R455,70, calculate the VAT payable on this amount. (2)

[18]

TOTAL: 150

END

ANSWER SHEET

Question 4.4.1

