GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

GAUTENG DEPARTMENT OF EDUCATION

PREPARATORY EXAMINATION

2020

10602

MATHEMATICAL LITERACY

PAPER 2

MARKS: 150

TIME: 3 hours

10 pages + 1 answer sheet and an addendum of 8 pages

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 1.1
   Use ANNEXURE B for QUESTION 1.3
   Use ANNEXURE C for QUESTION 2.1
   Use ANNEXURE D for QUESTION 3.1
   Use ANNEXURE E for QUESTION 3.2
   Use ANNEXURE F for QUESTION 3.3
   Use ANNEXURE G for QUESTION 4.1

   Hand in the ANSWER SHEET for QUESTION 1.1.5 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. The unemployment rate is one of the factors which affects our economy. Data is collected every quarter by Statistics South Africa (Stats SA) to indicate the level of unemployment. ANNEXURE A shows a table with the number of unemployed people from July 2018 to March 2019 for all the provinces in South Africa. ANNEXURE A also shows a pie chart with the percentage of unemployed people according to race for January 2019 to March 2019.

Study ANNEXURE A and answer the following questions.

1.1.1 What is the probability of having a province with more than three million unemployed people during January to March 2019? (2)

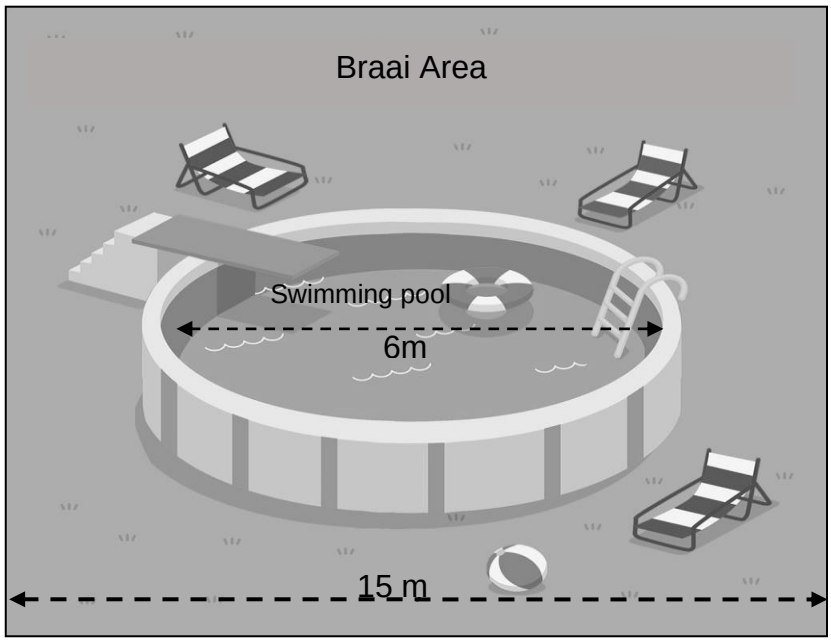
1.1.2 Dudu claimed that the number of unemployed people increases by a mean of 20 000 people every quarter. Verify her claim by determining the difference between the mean of July to September 2018 and the mean of October to December 2018. (6)

1.1.3 How many white people were unemployed during January to March 2019 if 15 868 thousand people were unemployed. (4)

1.1.4 Determine the interquartile range (IQR) of unemployed people for the period July to September 2018. (5)

1.1.5 The incomplete horizontal bars which represent the number of unemployed people have been drawn on the ANSWER SHEET. Write a title for the graph, label your axes and complete the bars for North West, KwaZulu-Natal and Limpopo on the ANSWER SHEET. (4)

1.2 Mpho wanted to pave the braai area at her house. The braai area has a circular swimming pool with a diameter of 6 m. The braai area is a square figure which is 15 m long on each side as indicated below.



Use the information above to answer the questions that follow.

1.2.1 Determine the area of the pool.

You may use the formula:

Area of circle = πr^2, where π = 3,142 (3)

1.2.2 Mpho bought interlocking paving bricks and the bricks are sold in pallets of 1 000 bricks.

- Each pallet sells for R3 500
- 48 bricks cover a square metre

Mpho claimed that she will spend more than R30 000 on paving bricks to pave the braai area. Verify her claim. (7)

1.3 Mpho is a 43-year-old manager at Gopola-Tiro Holdings and she earns a taxable income of R370 000 per annum. She contributes to a medical aid scheme for herself, her husband and their two 2 children. Use ANNEXURE B to answer the following questions.

1.3.1 Determine her annual medical credit. (3)

1.3.2 She contributes R4 380 to tax monthly and she has been complaining that she is over-taxed. Use calculations to prove whether her complaint is valid. (8)

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QUESTION 2

2.1 NSFAS bursaries are helping students with financial problems to achieve their goals and ensure that they acquire the necessary skills to contribute positively to the economy of the country. ANNEXURE C is a table of the number of students who received loans/bursaries from NSFAS and the amounts provided. Study the table on ANNEXURE C and answer the following questions.

2.1.1 Determine the value of **A**, the total amount provided in 2012. (2)

2.1.2 Show that the range of amounts provided to public HEIs is 5 455 796 544 Rands. (2)

2.1.3 Find the value of **B**, the percentage change for 2014.

You may use the formula:

$$\textbf{Percentage change} = \frac{\textit{New amount} - \textit{Previous amount}}{\textit{Previous amount}} \times 100\%$$

(2)

2.1.4 Calculate the value of **C**, the total number of beneficiaries of NSFAS in 2016 if the mean is 402 154. (4)

2.1.5 What is the probability of getting an amount that is greater than two billion rands provided to TVET colleges? Give your answer in decimal form. (3)

2.1.6 Give a reason why the total amount provided to beneficiaries of NSFAS loans/bursaries increases with time. (2)

2.1.7 Describe the trend in the number of beneficiaries from HEIs annually over the period of time as shown in the table. (4)

2.2 Pule has invested an amount of R58 000 for his son's education for a period of 2,5 years at an interest rate of 5,5% compounded annually. He claims that the amount will be enough to pay for the total cost of R80 000 at the end of the investment. Is his claim valid? (6)

2.3 Water tariffs are adjusted every year and the table below represents the domestic water tariff for July 2019. Pule has received the water bill with the table of water tariffs for his domestic consumption. Jabu and his son, who is a 12 year old learner, share the house with Pule, and they have agreed to share the water bill proportionally.

Study the following table below and answer the questions that follow.

Domestic water tariff for 30 days		
Category	**Water usage per kℓ**	**Charge per kℓ (R)**
A	0 – 6 kℓ	11,61
B	7 – 12 kℓ	16,56
C	13 – 18 kℓ	21,75
D	19 – 24 kℓ	25,16
E	25 – 30 kℓ	28,76
F	31– 42 kℓ	31,08
G	42 – 72 kℓ	33,26
H	More than 72 kℓ	35,61
N.B. Charges are VAT exclusive.		

[Provincial gazette no. 194]

2.3.1 Pule and Jabu have used 21 kℓ for the month of September. Calculate the VAT exclusive cost of the water usage for the month. (5)

2.3.2 Determine the VAT inclusive cost that Jabu has to pay. (4)

2.3.3 Their bill for December was R256.02 (VAT exclusive) and Jabu claimed that they used 16 kℓ. Verify his claim. (4)
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QUESTION 3

3.1 John and Muzi's family travelled 350 km from Johannesburg to Mbabane at an average speed of 100 km/h. Study the map on ANNEXURE D and answer the following questions.

3.1.1 What is the general direction of Maloma from Ngonini? (2)

3.1.2 They stopped for 20 minutes to refill petrol and had lunch for 40 minutes. If they left Johannesburg at 10:10, at what time would they arrive at Mbabane?

You may use the formula:

Average speed = $\frac{Distance}{Time}$ (4)

3.1.3 Muzi claimed that they will travel less than 300 km from Rocklands to Maloma. Verify his claim. (5)

3.1.4 They visited the provincial capitals i.e. Piggs Peak, Manzini and Hlatikulu. Which provincial capital was not visited? (2)

3.2 At Mbabane they went to see a doctor as Muzi's 2 sons had fever on arrival.

Study the floor plan of the medical centre on ANNEXURE E and answer the following questions.

3.2.1 Why will it be difficult to fix the toilet in the bathroom next to the waiting room? (2)

3.2.2 Muzi's sons (Lethabo and Tumi) had to see the doctor in the second examining room. Give the set of directions from the waiting room to the second examing room. (3)

3.2.3 Show that the area of the waiting room is 39 096 square inches. (3)

3.2.4 Hence convert the area of the waiting room to metres squared (m^2) if $1cm^2$ = 0,155 square inches. (4)

3.2.5 What is the probability **(as a percentage)** of having a door that opens outwards? Round-off your answer to the nearest whole number. (2)

3.3 The doctor has examined Lethabo and Tumi to get their status and compare it to the health status of John's son. Study the growth chart on ANNEXURE F and the weight status table below to answer the following questions.

WEIGHT STATUS TABLE	
BMI for age Percentile range	**Weight status**
$<5^{th}$ percentile	Underweight
5^{th} to $<85^{th}$ percentile	Healthy
85^{th} to $<95^{th}$ percentile	Risk of overweight
$\geq 95^{th}$ percentile	Overweight

3.3.1 Determine Tumi's weight status if he is 16 years old and his BMI is 16.6 kg/m^2. (2)

3.3.2 14-year-old Lethabo has a BMI that places him between the 85^{th} and the 90^{th} percentile curve. What is Lethabo's weight status? Suggest the advice that the doctor should give to Muzi? (3)

3.3.3 John claimed that his 17-year-old son who is 1,5 m tall and weighs 55 000 g has a healthier status than Muzi's sons. Verify his claim.

You may use the formula:

BMI = $\frac{Weight}{(Height)^2}$ (6)

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QUESTION 4

4.1 Rosh buys suitcases from India. The bags are packed in boxes as indicated in ANNEXURE G and transported in Rogue boxes in a ship. All boxes should be packed upright.

Study ANNEXURE G and answer the following questions.

4.1.1 Show that the height of the Rogue box is 2,8 m if its capacity is 13,86 m^3.

You may use the following formula:

$$\boldsymbol{Volume\ of\ rectangular\ box = Length \times Breadth \times Height}$$ (4)

4.1.2 Tira claims that they should pack the boxes in a Rouge box as follows: Length of the packing box against the width of the Rogue box and width of the packing box against the length of the Rogue box, in order to pack more boxes **on the base** of the Rogue box. Verify his claim. (8)

4.2
- Each suitcase is wrapped with a **triple layer** of bubble wrap plastic to protect it.
- The top and bottom of each suitcase are not covered.
- The dimensions of the suitcase are indicated below.



4.2.1 Determine the size of the plastic bubble wrap **(total surface area)** needed to cover the suitcase.

You may use the formula:

Surface area = 2(length × height) + 2(width × height) (5)

4.2.2 Show that the length of the plastic needed to cover the suitcase is 960 cm. (4)

4.3 Rosh buys each suitcase for INR 450 and sells it for R 500. She also pays R46,95 per box, for shipping when she collects the order.

1 Indian Rupee(INR) = 0,28 ZAR (South African Rand)

4.3.1 Determine the cost of each suitcase in ZAR. (2)

4.3.2 Bontle claims that Rosh gets more than 50% profit on each suitcase. Verify her claim. (5)

4.3.3 The price charged for shipping had been increased by 4,96% according to the inflation of 2019. How much was charged for shipping, per box in 2018? (4)

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TOTAL: 150

END

ANSWER SHEET

QUESTION 1.1.5

NAME _____ **CLASS:** _____

TITLE OF THE GRAPH: _____

