

KZN DEPARTMENT OF EDUCATION  
PINETOWN DISTRICT

# MATHEMATICAL LITERACY

## GRADE 10

### PAPER TWO

NOVEMBER EXAMINATION  
"2019"

MARKS

: 75

DURATION

: 1 ½ HOURS

#### INSTRUCTIONS & INFORMATION

- This paper consists of :  
4 QUESTIONS AND 8 PRINTED PAGES (including this cover page and annexure A)
- All calculations and steps must be shown clearly in ink.
- Number the answers correctly according to the numbering system used in this question paper.
- Round off **ALL** final answers appropriately according to the given context unless stated otherwise.
- An approved calculator (non-programmable and non-graphical) may be used, unless stated otherwise.
- Units of measurement must be indicated where applicable.
- Write neatly and legibly
- Diagrams are not drawn to scale

### QUESTION ONE (23 MARKS)

Lebo is a learner who lives in the Stanger area. He attends Stanger Comprehensive School, which has an enrolment of 450 learners. The school had many fund raising activities during the course of the year. They raised an amount of R 24 500, towards the schools Sports and Fun day. Meals were budgeted at R 18 per learner. Sound and entertainment amounted to 10% of the total amount raised. Mr Pillay, the school principal decided to donate R 8000. The sports stadium costs double the amount spent on banners and tags.

1.1) Study the budget for the school sports and Fun day, then answer the questions set :

<u>INCOME</u>		<u>EXPENSES</u>	
Income from fund raising	R 24 500	Hire of stadium	A
Donation	R 8000	Meals	B
		Banners & tags	R 1250
		Sound and entertainment	C
		Admin & telephone	R250
TOTAL INCOME	D		
AMOUNT LEFT OVER AFTER EXPENSES HAVE BEEN PAID			E

1.1.1) Calculate the values indicated by A,B,C,D,E (10)

1.1.2) Verify whether a **surplus** or a **deficit** was made. Substantiate your answer (2)

1.2) Mr Ndlovu lives in the same district that Stanger Comprehensive school is located in. The water tariffs for this municipality is shown below.  
All tariffs shown exclude VAT at 15%

<u>Industrial/ Business consumer</u>	<u>Residential consumer</u>	
	<u>Water used</u>	<u>Cost per kl used</u>
Flat rate of R 8,21 per kl used (No free water allowance)	0 – 6 kl	Free
	>6 – 20 kl	R8,03
	>20 – 40 kl	R10,11
	>40- 60kl	R15,28
	>60kl	R 18,50

Mr Ndlovu is classified as a residential consumer. He received a water bill with the following information:

<u>WATER BILL READING IN KL</u>		
<u>READING DATE</u>	<u>PREVIOUS READING</u>	<u>CURRENT READING</u>
15 SEPTEMBER 2019	4541 KL	4598 KL

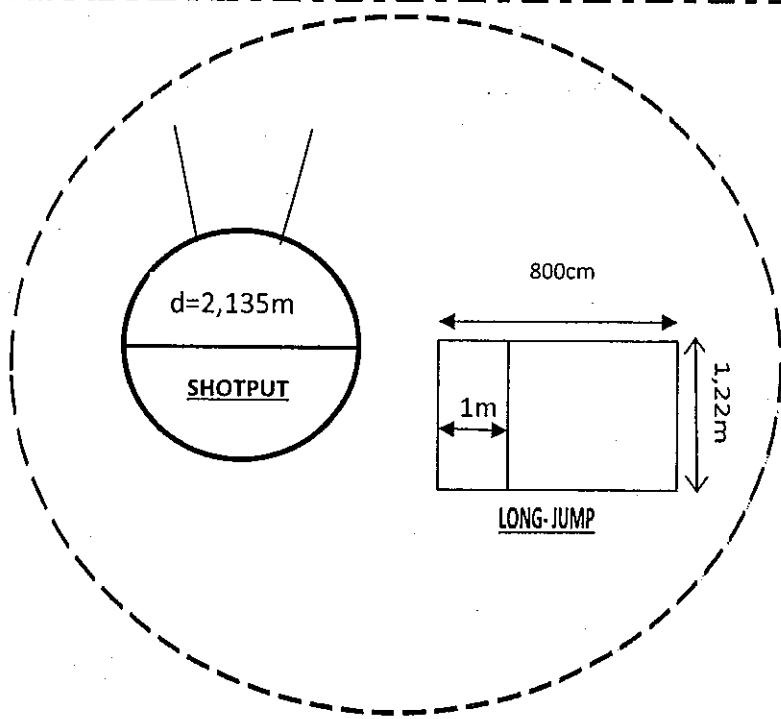
1.2.1) Mr Ndlovu was charged R660,54 (incl) for the above water reading.

Verify with calculations if the amount charged was correct. (7)

1.2.2) Suggest two reasons, why businesses are charged a flat rate whereas residential consumers are charged differently. (4)

### QUESTION TWO (21 MARKS)

For the Sports day the athletics committee will need the help of their maths literacy learners to set up the field for the events that will take place. The schools sports field is shown below with the running track as the outside of the pitch and the two field events namely shot-putt and long-jump being in the centre of the field.  
(Diagram not drawn to scale)



circumference of race track = 400m

2.1) Thando is taking part in the field event of the 1600m girls race. If the race track is 400m in circumference, how many laps will she need to do in order to complete the 1600m race? (2)

2.2) Thando would like to beat the record for the 1600m race, the previous record was a time of 7 min 23seconds . If her race starts at 11:05:17, what time does she need to end the race to beat the record? (3)

2.3) For the athletes there will be a water tank available for drinking, the water tank has a capacity of 50 litres. Verify whether there will be enough cups of water to provide for 300 athletes if each athlete needs one cup of water only ? (3)

1 cup = 250ml

2.4) The shot-putt pitch needs to be marked off, determine the circumference of the pitch needed to be marked of.  $C = 2 \pi r$   
(use pi as 3,142) (2)

2.5) To mark the shot-putt pitch white paint will be used. 500ml of paint can cover  $1\text{m}^2$ . Paint costs R56,90 per litre. Calculate how many litres of paint will be needed to cover the circumference of the shot-putt pitch and the total cost of the paint (4)

2.6) The long jump pit has a 1m jumping platform before the actual sand pit. The remainder of the pit has to be filled in with sand, Calculate the area of the space to be filled with sand.  
( Area = Length x Breadth ) (3)

2.7) One of the mathematical literacy learners did a scale drawing of the athletics field. If the length of the long jump pit (including the jumping platform) was shown as 5cm on the scale drawing, determine the scale that was used on the drawing. (4)

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### QUESTION THREE (21 MARKS)

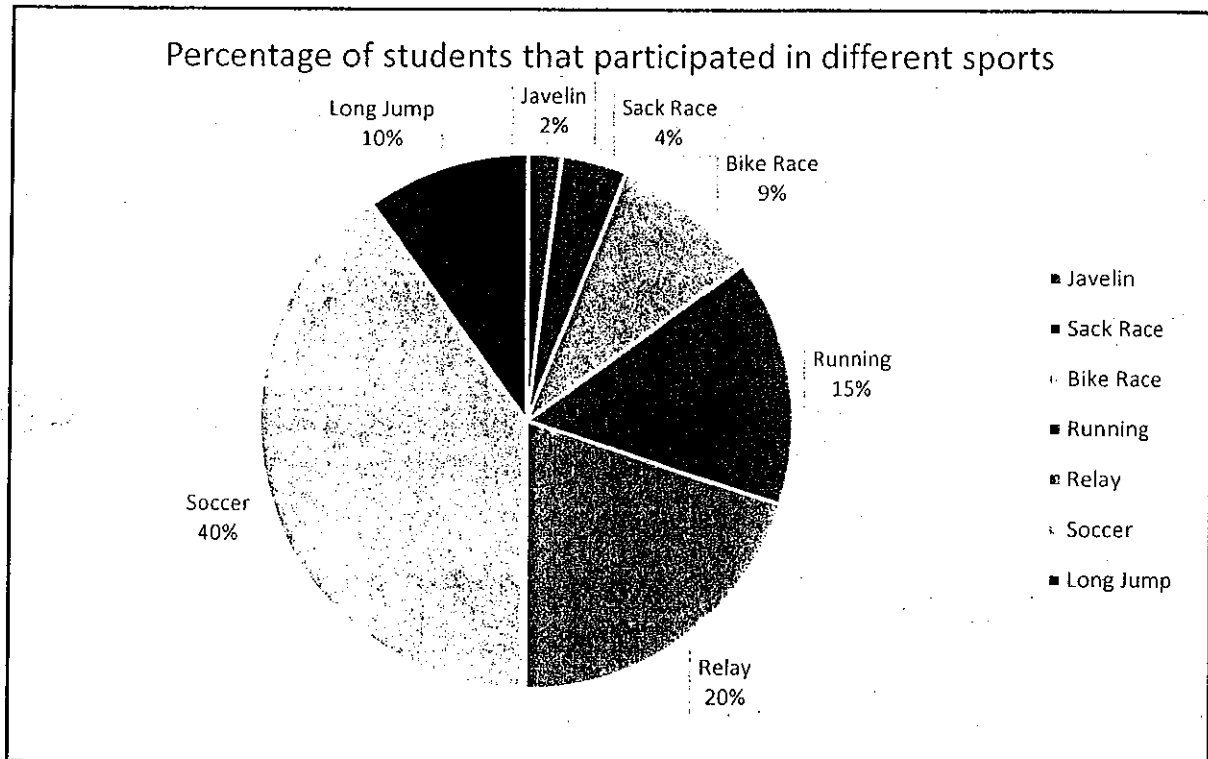
A neighbouring school, Sunshine Secondary School held their sports day a week after Stanger Comprehensive School.

Sunshine Secondary school has a population of 1500 students.

Only 60% of the total population participated in the sports day

3.1) The pie chart shows the percentage of students that **participated** in different sports on the schools sports day.

Consider the pie chart below and answer questions that follow:



3.1.1) Find the total number of students that participated in javelin and long jump (3)

3.1.2) The school coach stated that the number of students who participated in the bike race and relay is **95 learners less** than the number of students who participated in running and sack race . Verify whether his statement is correct (4)

3.2)

The mass (kg) of the Soccer Team players at Sunshine Secondary school who won the 2019 Inter House competition are as follows:

60,2	67,5	69	70,3	65	67,3	70,5	59,6
64	59,5	55,2	65	60,7	53	65	58,5

3.2.1) Is the above data discrete or continuous? Give a reason. (2)

3.2.2) Determine the range of the weights. (2)

3.2.3) Mr Singh, the coach, claims that the mean weight of his team is 63,1kg .Verify whether his claim is valid. Show by calculations. (3)

3.2.4) Determine the median weight. (3)

3.3) During the December holidays, Mr Singh who lives in Stanger, will be visiting his family in Dundee. He claimed that he will have to travel for more than 270km to reach his destination

Refer to the map on Annexure A and show (using calculations) whether his claim is valid (4)

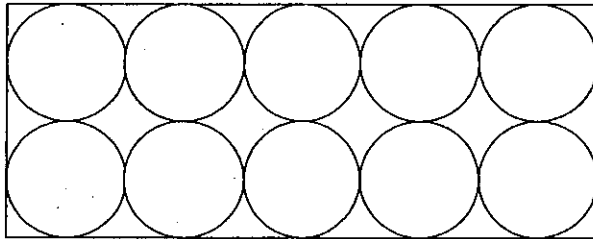
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**QUESTION FOUR (10 MARKS)**

The school has received a sponsorship of boxes of cans of cooldrink for learners for the sports day.

A can of cooldrink has a diameter of 8cm and a height of 14 cm. The cans are packed upright into cardboard boxes that can take 10 cans in 2 rows of 5 as illustrated below:



Top view of box

4.1) There are 18 cans of Fanta, 12 cans of coke and 10 cans of crème soda. If one can is selected at random by a learner, what is the probability as a percentage, that it is NOT a can of coke? (3)

4.2) Calculate the capacity of one can of cooldrink in litres (3)

You may use :  $V = \pi r^2 h$  (use pi as 3,142)

4.3) One of the educators stated that each box can be packed with a maximum of 40 cans. Verify whether his statement is correct, if the box has a height of 63cm. (4)

**END OF PAPER**

**TOTAL : 75 MARKS**

**GOODLUCK ☺**

ANNEXURE A



SCALE

1 : 3 000 000



MATHEMATICAL LITERACY

GRADE 10

NOVEMBER – 2019

MARKING GUIDELINES

*[Handwritten signature]*  
4/11/2019

<u>QUEST NUM</u>	<u>SOLUTION</u>	<u>EXPLANATION</u>	<u>MARKS</u>
1.1.1	$A = 1250 \times 2 \checkmark M = 2500 \checkmark A$ $B = 18 \times 450 \checkmark M = 8100 \checkmark A$ $C = 10\% \times 24\,500 \checkmark M = 2450 \checkmark A$ $D = 24500 + 8000 \checkmark M = 32\,500 \checkmark A$ $E = 32\,500 - 14\,550 \checkmark M = 17950 \checkmark A$	5 method 5 accuracy	10
1.1.2	Surplus. There is money leftover after all expenses have been paid $\checkmark \checkmark A$	2A	2
1.2.1	$4598 - 4541 = 57 \text{ kl} \checkmark A$ 6 free $14 \times R 8,03 = R 112,42 \checkmark A$ $20 \times R 10,11 = R 202,20 \checkmark AA$ $17 \times R 15,28 = R 259,76 \checkmark$ <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <math>R 574,38 \checkmark CA \text{ excl} \times 115\%</math>  <math>= R 660,54 \text{ (incl)} \checkmark CA</math> </div> Statement is correct $\checkmark$	1A kl     3A 1CA amt excl  1CA amt incl  1CA statement	7
1.2.2	<ul style="list-style-type: none"> <li>Businesses have a higher consumption rate <math>\checkmark \checkmark A</math></li> <li>The sliding scale for residential consumers may encourage them to use water wisely (the more you use, the higher the cost per kl) <math>\checkmark \checkmark A</math></li> </ul> Accept any logical answer	2 × 2A	4
2.1	$1600 \div 400 \checkmark M = 4 \text{ laps} \checkmark A$	1M 1A	2
2.2	$11:05:17 + 7 \text{ min } 22 \text{ sec} \checkmark \checkmark M$	2M	3

	= 11:12:39 ✓ A - or earlier	1A	
2.3	50 litres × 1000 = 50 000 ml 50 000 ml ÷ 250 ml ✓ M = 200 cups ✓ A  This will not be enough for 300 students ✓ CA	1M div 1A 200 CUPS 1CA Justification	3
2.4	C = 2 × 3,142 × 1,0675 ✓ S = 6,708 m ✓ A	1S 1A	2
2.5	1 litre of paint will cover 2 m <sup>2</sup> 6,708 ÷ 2 ✓ M = 3,35 Therefore 4 litres ✓ A will be needed.  4 × R56,90 ✓ M = R 227,60 ✓ CA	1M 1A correct litres  1M : × price 1CA answer	4
2.6	Length = 8 m – 1 m = 7 m ✓ A  Area = 7 m × 1,22 m ✓ S = 8,54 m <sup>2</sup> ✓ A	1A correct length 1S 1A	3
2.7	5 cm : 800 cm ✓ A (÷5) (÷5) ✓ M 1 ✓ : 160 ✓ CA	1A 1M – divide by 5 2CA – correct scale	4
3.1.1	Num participated = 60% × 1500 = 900 students ✓ A  Javelin = 2% × 900 = 18 Long jump = 10% × 900 = 90  TOTAL = 18 + 90 ✓ CA = 108 ✓ CA	1 A correct num of students that participated  1CA adding correct values 1CA	3
3.1.2	BIKE AND RELAY Bike = 9% × 900 = 81 Relay = 20% × 900 = 180 TOTAL = 261 ✓ A  RUNNING AND SACK Running = 15% × 900 = 135 Sack = 4% × 900 = 36 TOTAL = 171 ✓ A	1A correct total   1A correct total	4

	<p>DIFFERENCE = 261 – 171 = 90 ✓ CA Statement incorrect ✓ J</p>	<p>1 CA difference 1J</p>	
3.2.1	<p>Continuous – mass can exist as decimals/ fractions ✓ ✓ A</p>	2A	2
3.2.2	<p>Range = 70,5 – 53 ✓ M = 17,5 ✓ CA</p>	<p>1 M subtracting correct values  1CA answer</p>	2
3.2.3	<p>Mean = 1010,3 ÷ 16 ✓ MA = 63,1 ✓ CA  His claim is valid ✓</p>	<p>1MA 1CA  1 reason</p>	3
3.2.4	<p>(64+65) ✓ A ÷ 2 ✓ M = 64,5 ✓ CA</p>	<p>1 A correct middle values 1M divide by 2 1CA answer</p>	3
3.3	<p>8,5cm ✓ A × 30km ✓ M = 255km ✓ CA OR  8,6cm ✓ A × 30km ✓ M = 258km ✓ CA  NO he will travel less than 270km ✓ CA</p>	<p>1 A correct map measurement  1M multiplying by scale 1CA correct distance in km  1 CA Conclusion</p>	4
4.1	<p>18+ 12 +10 = 40 ✓ A P(Not coke) = <math>\frac{18+10}{40}</math>  <math>= \frac{28}{40} \times 100</math> ✓ M = 70% ✓ A</p>	<p>1A total  1M concept of % 1A</p>	3
4.2	<p>V = 3,142 × 4<sup>2</sup> × 14 ✓ S = 703,808cm<sup>3</sup> ÷ 1000 ✓ M = 0,7 litres ✓ A</p>	<p>1 Substitution of correct values 1M Conversion 1A</p>	3

4.3	<p>63cm ÷ 14cm ✓ M = 4,5</p> <p>Therefore 4 layers high ✓ A</p> <p>Total number of cans = 10 × 4 = 40 cans ✓ CA</p> <p>Statement is correct ✓ CA</p>	<p>1M division of height 1A 4 layers</p> <p>1CA total cans</p> <p>1 CA Conclusion</p>	4
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**TOTAL : 75 MARKS**