Education

KwaZulu-Natal Department of Education

NATIONAL SENIOR CERTIFICATE

GRADE 12

MATHEMATICAL LITERACY P2

PREPARATORY EXAMINATION

SEPTEMBER 2018

MARKS: 150

TIME: 3 hours

This question paper consists of 14 pages, 1 Answer Sheet and an Addendum with 6 Annexures (7 pages).

INSTRUCTIONS AND INFORMATION

1. This question paper consists of **FOUR** questions. Answer **ALL** the questions.

2.

2.1 Use the ANNEXURES in the ADDENDUM to answer the following questions.

- ANNEXURE A for QUESTION 1.1
- ANNEXURE B for QUESTION 1.3
- ANNEXURE C for QUESTION 2.2
- ANNEXURE D for QUESTION 3.1
- ANNEXURE E for QUESTION 3.4
- ANNEXURE F for QUESTION 4.4

2.2 Answer QUESTION 2.1.3 on ANSWER SHEET 1, write your surname and name in the spaces on the ANSWER SHEET and hand in the ANSWER SHEET with your ANSWER BOOK'.

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

4. Start EACH question on a NEW page.

5. You my 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. Write neatly and legibly.

QUESTION 1

1.1

Mr Reddy has just got a tender to upgrade one of the stadia at the Umgungundlovu District Municipality. He decided to do research on transaction charges, since he will be using his bank account frequently.

Use ANNEXURE A in the ADDENDUM and the information above to answer the following questions.

1.1.1 In March Mr Reddy established one external stop order and then 3 internal stop orders. Determine how much was deducted as stop order fee. (3)

1.1.2 A withdrawal from the branch of R10 000 cash was done to pay a supplier. Mr Reddy's friend advised him to use debit orders so that he can save more than 6 times on external debit costs. Verify, showing ALL calculations, whether the advice is correct. (5)

1.2

Mr Reddy has a total of 15 permanent employees and a number of casual workers. The difference between the lowest and highest paid worker can be expressed in a ratio of 1 : 5.

1.2.1 Determine the salary of the lowest paid worker if the highest paid worker is earning R13 500 pm. (2)

1.2.2 The average (mean) wage is R5266,70 pm. Use the average wage to determine the total monthly wages. (3)

1.3

ANNEXURE B shows a picture of a sports field that looks like the one that must be upgraded. Areas to be covered by tartan track are 2 rectangular areas labelled A , half circles labelled B and 2 areas labelled C.

1.3.1 If the width of the line markings is 0,05m and the width of the lane is 1,22m, determine the radius labelled R. (4)

1.3.2 Show that the area of the half circle to be covered by tartan track is 2669,36m^2.

You may use the following formula.

Area of a circle $= \pi \times$ **radius**^{2}, use $\pi = 3{,}142$ (4)

1.3.3 Hence, calculate the total area to be covered by tartan track.

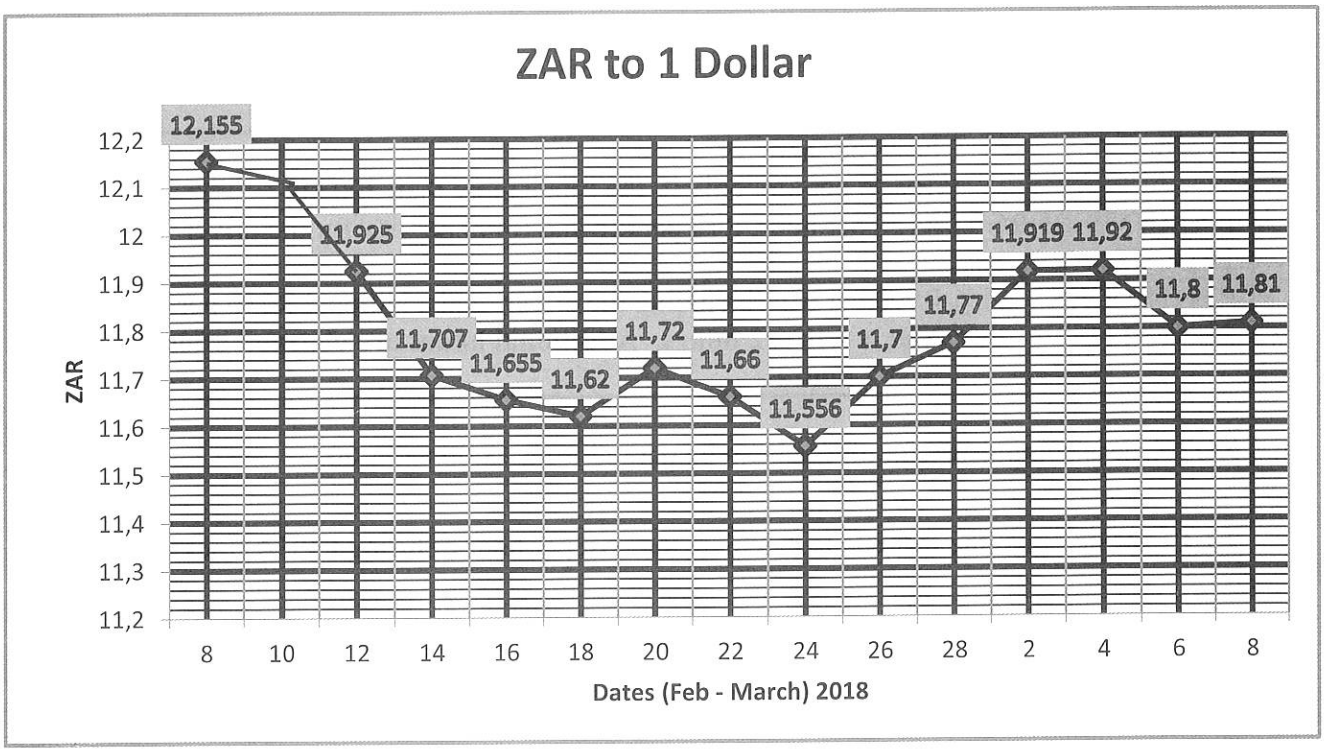
NOTE: the area of both parts C together is 87,84m^2

You may use the following formulae.

Area of rectangle = length × breadth

Area of circle $= \pi \times$ **radius**^{2}, use $\pi = 3{,}142$ (6)

1.4 Tartan tracks are imported from USA. In USA tartan track costs 3 000 US dollars (US$) per 100 m^2 or part thereof. The graph below displays historical exchange rates between the South African Rand and the US Dollar from February to March 2018.



ZAR = South African Rand

www.exchange-rates.org/history/ZAR/USD/G/30

1.4.1 Explain what is happening to the value of the Rand from 12 February to 18 February 2018. (2)

1.4.2 It is advisable to buy foreign goods when the value of the Rand is gaining strength. Calculate how much the tartan material (per 100m^2) will cost in ZAR on the date on which the value of ZAR is strong. (3)

1.4.3 Hence, determine the total cost (in Rands) of the tartan material calculated in 1.3.3. (3)
[35]

QUESTION 2

2.1 North Coast Athletic Club (NCAC) must hire a truck to collect training equipment from Johannesburg.

They got the following quotations from the removal companies:

CPHA	R228 per hour or R9,00 per km, only if the trip is more than 300 km
JOHANNESBURG TRUCKS	R120 per hour, R12 per km and R400 per day for the driver
REDTRUCKS RENTALS	R990 per trip (including the driver) and additional R250 per hour **NB: A trip = 2 hours. Additional hours are charged after the first 2 hours**

NOTE: It is compulsory for all trucks to be parked from 18:00 to 06:00.

2.1.1 Write down the formula to calculate the cost per hour of hiring CPHA trucks. (2)

2.1.2 The return trip to collect the material in Johannesburg will take 3 days. Calculate the value of A. Show your workings.

TABLE 1: Costs of hiring trucks for three days

DISTANCE (KM)	**50**	**200**	**400**	**800**	**1200**
CPHA (COST) (R)/ hour	8208	8208	8208	8208	8208
JOHANNESBURG TRUCKS (R)	2040	4080	7440	13680	**A**

(4)

2.1.3 (a) Use ANSWER SHEET 1 to draw line graphs showing hiring costs for CPHA and Johannesburg Trucks. (6)

(b) Explain the meaning of the point of intersection. (2)

2.2

North Coast Athletic Club (NCAC) uses the percentile charts to determine the health status of athletes who are joining the club.

2.2.1 Study the percentile chart in ANNEXURE C and answer the questions that follow. NCAC allows athletes whose BMI is between the 5th and the 85th percentile to join the club. Determine the maximum BMI a boy should have to be able to join the club. (2)

2.2.2 Hence, determine the maximum weight of the boy whose BMI is considered healthy for a boy athlete.

You may use this formula:

$$\textbf{BMI} = \frac{\textbf{weight (kg)}}{(\textbf{height m})^2}$$ (4)

2.2.3 Mrs Smith is demanding that her 14 year old boy whose weight is 48kg and whose height is 1,3m, be admitted. Calculate the BMI of this boy to verify whether Mrs Smith's demand is justified. (4)

2.2.4 At the beginning of the year, the Club accepted 15 new girls running medium and long distances. If the BMI of girls running long distances is above the upper quartile, calculate the number of girls running long distances. Show your calculations. (3)

2.3

A total of 8 athletes qualified for an international competition to be held in USA. The following table shows the height and the shoe sizes of the athletes who qualified.

Table 2: Height and Shoe sizes

	Males					Females		
Height (cm)	160	165	170	178	175	140	145	158
Shoe Size	6	7	8	$8\frac{1}{2}$	9	$4\frac{1}{2}$	5	$6\frac{1}{2}$

2.3.1 Explain the trend you notice between the shoe sizes and the height. (2)

2.3.2 Calculate the median shoe size of the 8 athletes who qualified. (2)

2.3.3 Calculate the probability (as a decimal fraction) of randomly choosing a shoe size which is NOT less than 7. (3)

[34]

QUESTION 3

3.1

Painting Specialists cc are to paint the sports field. The special paint needed to mark the sports field must be collected from Johannesburg.

Use the map in ANNEXURE D and the distance chart below to answer the following questions.

3.1.1 Convert the bar scale of this map to a number scale. Show your workings.

NB: Your number scale be rounded off to the nearest 100 000 (4)

3.1.2 The hired truck to Johannesburg must use a route via Durban to collect other goods from the harbour. The distance between Durban and Richards Bay is 170 km. Use the number scale calculated in 3.1.1 to verify that the total distance from Richards Bay via Durban 758 km. (4)

3.1.3 Provide a possible reason why the major distance of Durban to Johannesburg calculated in 3.1.2 and the distance on the distance chart differ. (2)

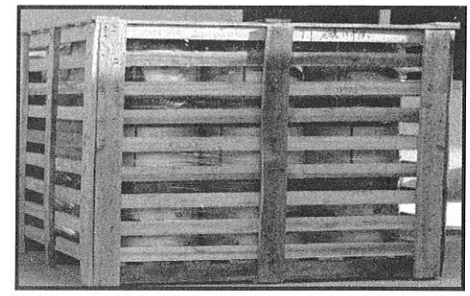
Table 3: Distance Chart

	BL	CT	D	EL	G	JHB	K	PE	P
Beaufort West	544	460	1178	605	492	942	504	501	1000
Bloemfontein (BL)	-	1004	634	584	601	398	177	677	456
Britstown	398	710	1032	609	496	725	253	572	783
Cape Town (CT)	1004	-	1753	1099	899	1402	962	769	1460
Colesberg	226	778	860	488	375	624	292	451	682
De Aar	346	762	980	557	444	744	305	520	802
Durban (D)	634	1753	-	674	854	588	811	984	646
East London (EL)	584	1079	674	-	180	982	780	310	1040
George	773	438	1319	645	465	1171	762	335	1229
Graaff-Reinet	424	787	942	395	282	822	490	291	880
Grahamstown (G)	601	899	854	180	-	999	667	130	1057
Harrismith	328	1331	306	822	929	282	505	1068	332
Jo'burg (JHB)	398	1402	588	982	999	-	472	1075	58
Kimberley (K)	177	962	811	280	667	472	-	743	530
Klerksdorp	288	1271	645	872	889	64	308	1009	222
Kroonstad	211	1214	537	795	812	87	339	888	245
Ladysmith	410	1413	236	752	932	364	587	1062	422
Mafikeng	464	1343	821	1048	1065	287	380	1141	294
Musina	928	1932	118	1512	1529	530	1071	1605	472
Nelspruit	757	1762	707	1226	1358	335	827	1434	322
Oudtshoorn	743	506	1294	704	532	141	703	394	1199
Pietermaritzburg	555	1674	79	595	775	509	732	905	567
Polokwane	717	1721	907	1301	1318	319	791	1394	261
Port Elizabeth (PE)	677	769	984	310	130	075	743	-	1133
Pretoria (P)	456	1460	646	1040	1057	58	530	1133	-
Queenstown	377	1069	676	207	269	775	554	399	833
Umtata	570	1314	439	235	415	869	747	545	928
Upington	588	894	1222	982	851	796	411	945	854
Welkom	153	1156	564	737	754	258	294	830	316

3.2 Below is a wooden crate used to load 20-litre paint tins. The table below shows the dimensions of the tins and the crate.

TABLE 4: Dimensions of a tin and the wooden crate

TIN OF PAINT			WOODEN CRATE	
Diameter	Height		Width	Height
32cm	33cm		1,1m	1,26m

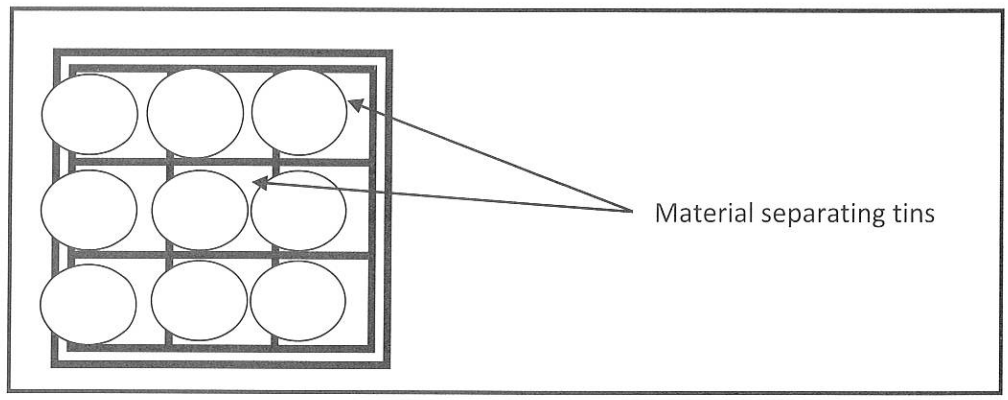


3.2.1 Use the dimensions of the tin to determine the height of the crate if 3 tins are loaded on top of each other.

NOTE: There is no space between the tins when loaded on top of each other. (2)

3.2.2 Hence show that the volume of the wooden crate is approximately $0,9m^3$.

NOTE: Tins are separated by material which is 10mm thick as shown in the top view below. (6)



You may use the following formula:

Volume of a Rectangular prism = length x width x height

3.2.3 The crate contains six tins of white paint, two tins of red paint and a tin of green paint. Determine the probability of randomly offloading a tin with green or red paint. (3)

3.3

Painting Specialists cc is running a fundraising campaign with Vodacom for its 20th anniversary celebration. Anyone can sms "Happy anniversary Painting Specialists" at a rate of R1,50 per local sms and R3,00 per international sms to stand a chance of winning R1 000 every month. From the sms costs Vodacom takes 50 cents and R1,74 per local and international sms, respectively.

3.3.1 Is it true that Painting Specialists cc is gaining more from a local sms as compared to an international sms? Justify your answer by comparing the percentage gained from the income of the sms's. (6)

3.3.2 The target was to raise a total of R30 000 a year through sms's. Did the company achieve its target if a monthly average of 2 000 local and 60 international sms's were received? Show your workings to support your answer. (5)

3.3.3 The average figures mentioned in 3.3.2 suggest that an international participant has a less than 2% chance of winning in a lucky draw. Is this true? Show calculations to support your answer. (4)

3.4

A fundraising dinner was also hosted at Blue Marine Guest House. The street map in ANNEXURE E shows the directions to Blue Marine Guest House.

Study the map carefully and answer the questions that follow.

3.4.1 Determine the total sets of robots that motorists have to pass on John Ross Highway/R34 after crossing the N2 but before turning into Krewelkring Street. (2)

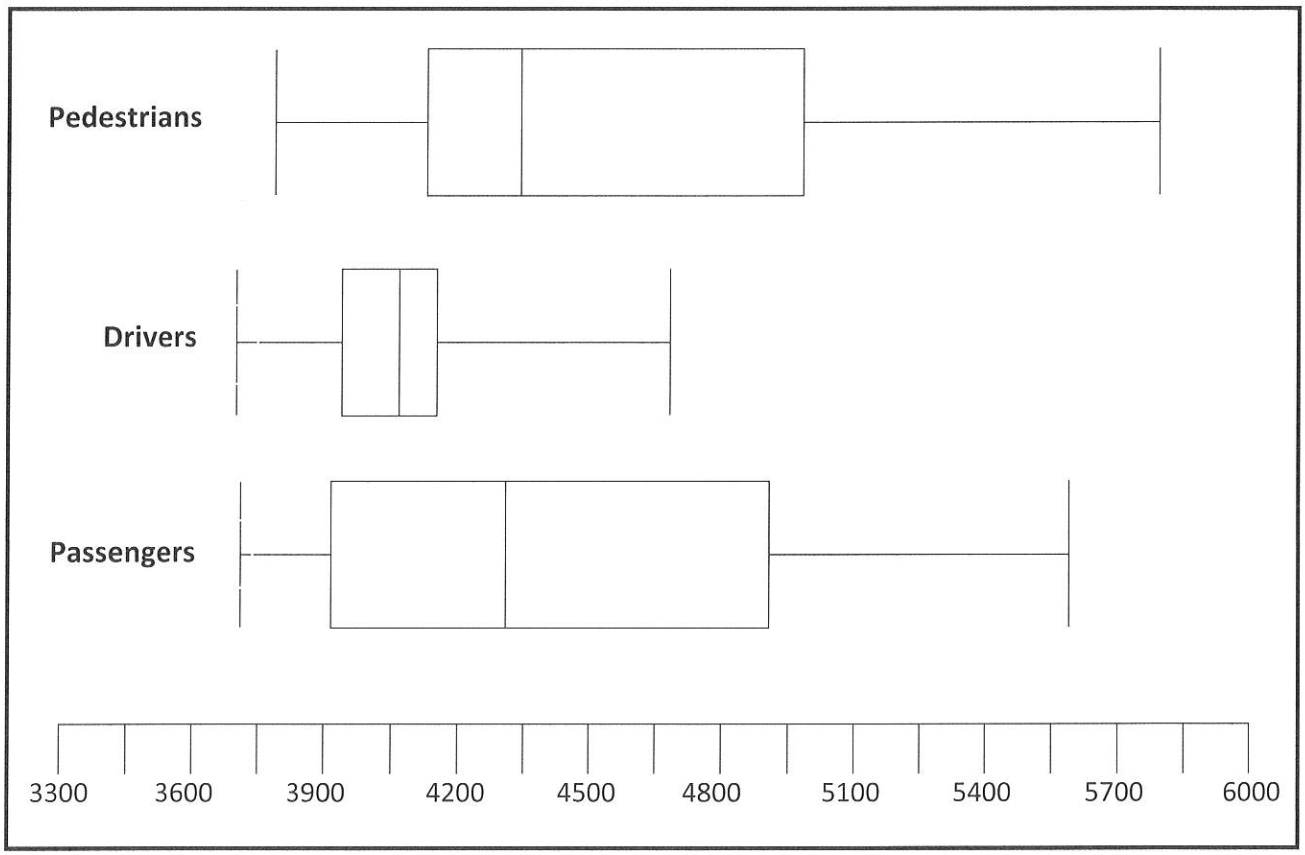
3.4.2 What is the relative direction of Blue Marine Guest House from the airport? (2)

3.4.3 One of the guests from Durban mistakenly passed the John Ross Highway. Give directions for the shortest route that must be taken by the guest to reach Blue Marine Guest House now. (3)

[43]

QUESTION 4

4.1 1n 2016 Automobile Association of South Africa (AA) issued data about road fatalities (deaths) from 2007 to 2016. The following box and whisker plot below shows a summary of road fatalities from 2010 to 2016.



Source: https://businesstech.co.za/news/motoring/

4.1.1 Compare the range of fatalities of pedestrians and drivers. (5)

4.1.2 Is it true that more than three quarters of passengers fatalities is above 3900 per year? Justify your answer by referring to the box and whisker plot. (3)

4.2

In 2016 the total road fatalities in South Africa was 14 071. The pie chart below shows the distribution of 2016 road fatalities per province. Table 5 shows population and percentage of road fatalities in 2016.

Study the pie chart and answer the questions that follow.

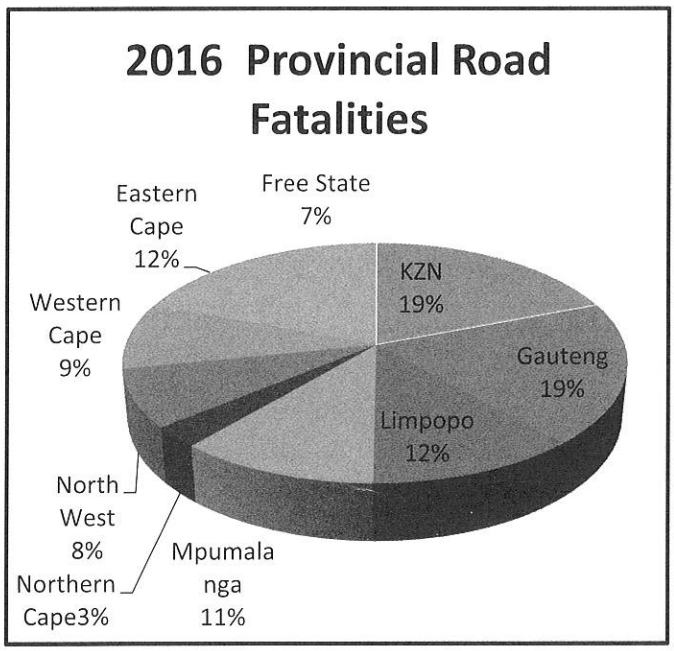


TABLE 5: POPULATION PER PROVINCE IN 2016

Province	Population	% ROAD FATALITIES
Gauteng	14 078 669	0,02%
KZN	11 074 784	0,03%
Free State	2 866 678	0,03%
Northern Cape	1 213 996	

Source: www. statssa.gov.za

4.2.1 Determine the road fatalities in KZN if the total road fatalities in South Africa was 14 071 in 2016. (2)

4.2.2 The Minister of Transport said the pie chart is showing that it is more dangerous to drive in Northern Cape than in Gauteng. Calculate the percentage of road fatalities of Northern Cape to verify the validity of the Minister' s claim. (6)

4.3

Ms Khumalo was tasked by the company to find a hall to host the matric dance for one of the schools in Ngwelezane. She received the following table of cost for hiring the Community town hall.

The following table shows the costs of hiring 2 halls under the Umhlathuze municipality.

TABLE 6: Cost and duration of hiring the Community hall

	Use without profit		Use with profit	
	Excluding VAT	**Including VAT @ 15%**	**Excluding VAT**	**Including VAT @ 15%**
Per day	R533,33		R 562,62	R 647,01
Per hour / day	R 30.70		R 32,46	R 37,33
Per hour / Evening	R 35,00		R 38,84	R 44,78

DAY HOURS	EVENING HOURS
05:00 to 17:00	After 17: 00 to 05:00

4.3.1 The function was going to start at 16:00 on Friday and finish on Saturday at 06:00. Calculate the duration (in hours) of this function.

NB: No profit is to be made. (2)

4.3.2 Hence, determine the total costs of hiring the hall for this function, including VAT.

NOTE: VAT = 15% and no profit is to be made. (4)

4.3.3 The organisers decided to change the starting and the finishing times. Verify that if the function was booked to start an hour late and be ended an hour earlier, more than R70,00 was going to be saved. Show your workings. (5)

4.4

Ms Khumalo is interested in seeing the impact of the revised tax brackets implemented in March 2018. In 2018, her basic monthly salary is R28 952,00. One of her deductions is medical aid which is R980,00 per month . She is the only member in the medical aid.

NOTE: Pension Fund contribution is 7.5% of the basic salary

Study the 2018/2019 tax table in **ANNEXURE F** and answer the questions that follow.

4.4.1 Explain the difference between tax rebate and tax threshold. (2)

4.4.2 Calculate Ms Khumalo's annual income tax payable for the 2018/2019 financial year, if her annual taxable income is R321 367,20. (5)

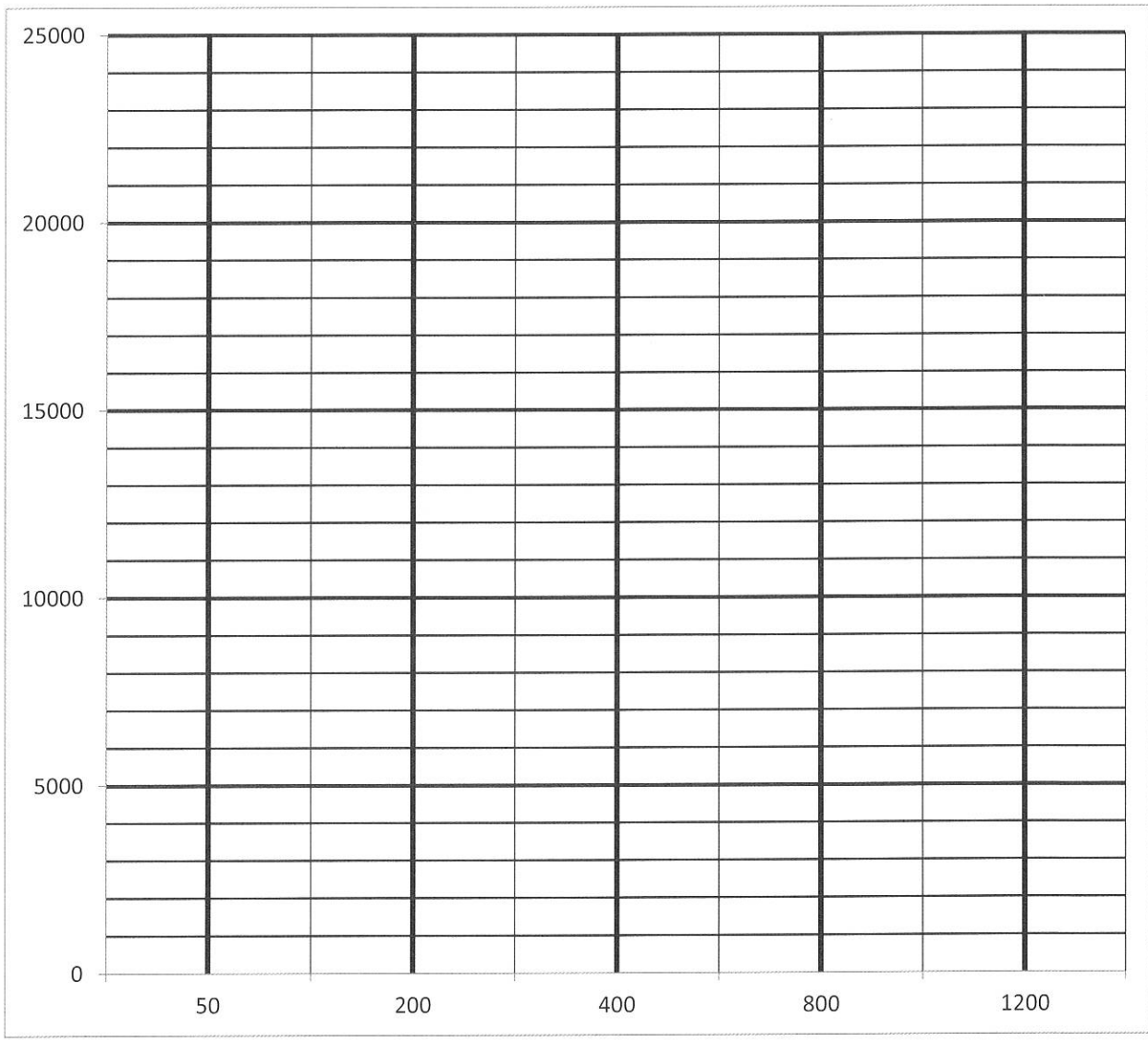
4.4.3 The Minister of Finance said the new tax rebate and medical tax credits will help taxpayers in tax bracket 3 to save around R500,00 per annum. Verify this by determining how much Ms Khumalo would save per year with the introduction of the new rebate and relief for the medical tax expenses. (4)
[38]

TOTAL: [150]

ANSWER SHEET 1

QUESTION 2.1.3 (a)

NAME: _____ **CLASS:** _____



PLEASE TEAR ON DOTTED LINE

Education

KwaZulu-Natal Department of Education

MATHEMATICAL LITERACY P2

PREPARATORY EXAMINATIONS

ADDENDUM

SEPTEMBER 2018

NATIONAL SENIOR CERTIFICATE

GRADE 12

This Addendum consists of 7 pages with 6 Annexures.

ANNEXURE A

QUESTION 1.1

PAY AS YOU TRANSACT PRICING

These fees are charged for transactions that are not included and covered by the bundle fee or when the maximum number of transaction includedin the bundle fee has been exceeded.

Pay as you transact	
Minimum monthly service fee*	R104.00

* Includes ATM withdrawals, electronic inter-account transafers, electronic account payments, cheque card purchases and debit orders.
If the combined value of the transaction fees exceed the minimum service at the end of the month; the higher amount will be charged.

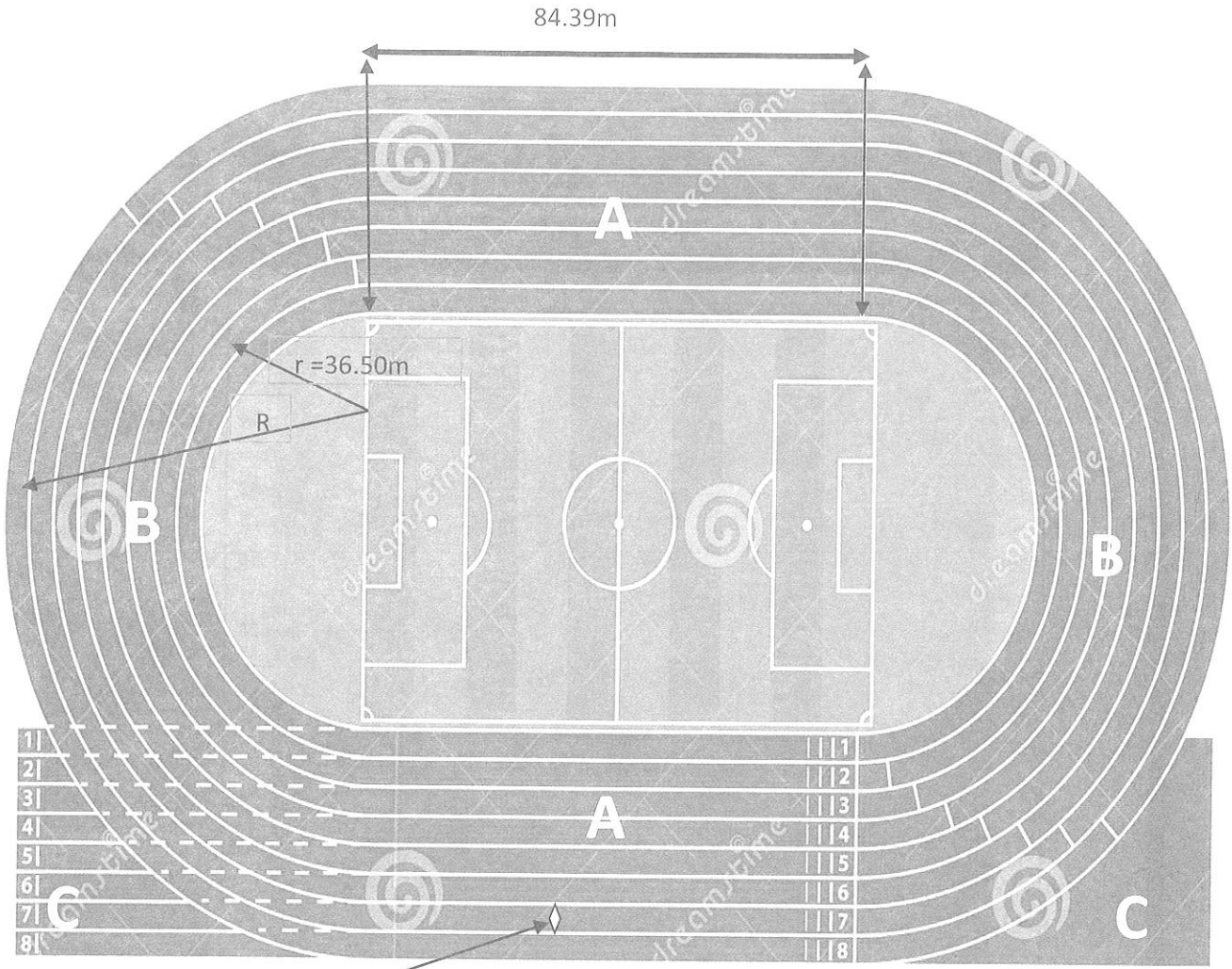
Deposits (Cash-in)	ATM	Branch
Cash deposit	R1.80 per R100.00 or part thereof	R8.00 + R1.80 per R100.00 or part thereof (R40.00 min.)
Cheque deposits	R42.00	R42.00
Post dated cheque	R115.00	
Cash withdrawals (Cash-out)	**ATM**	**Branch**
Cash withdrawals	R1.80 per R100.00 or part thereof	R40.00 + R1.80 per R100.00 or part thereof
Other banks ATM cash with-drawals	R8.00 + R1.80 per R100.00 or part thereof	
Cheque encashment	R100.00 + R40.00 + R1.80 per R100.00 or part thereof	
Cash withdrawal at a retailer till	R1.80	
International ATM Cash with-drawals	R40.00 + R1.80 per R100.00 or part thereof + 2.75% International transaction fee	
Payments	**ATM/Online**	**Branch**
Account payment	R5.50	R55.00
Inter-account transfer	R4.00	R55.00
InstantMoney – below R1000.00	R9.95	
InstantMoney – above R1000.00	R11.95	
Debit orders – internal	R4.50	
Debit orders – external	R16.50	
Stop orders – internal	R4.50	
Stop orders – external	R5.50	
Stop order – establish, amend, cancel*	R17.00	
Bank cheque	R115.00	
Cheque issued	R100.00	
Automatic cheque clearance fee	R115.00	
Card purchases (Swipe)	FREE	

*Alternative to stop orders – set up daily, weekly or monthly scheduled payments on Internet banking or on the Mobile App for free.

Source: www.standard bank.co.za

ANNEXURE B

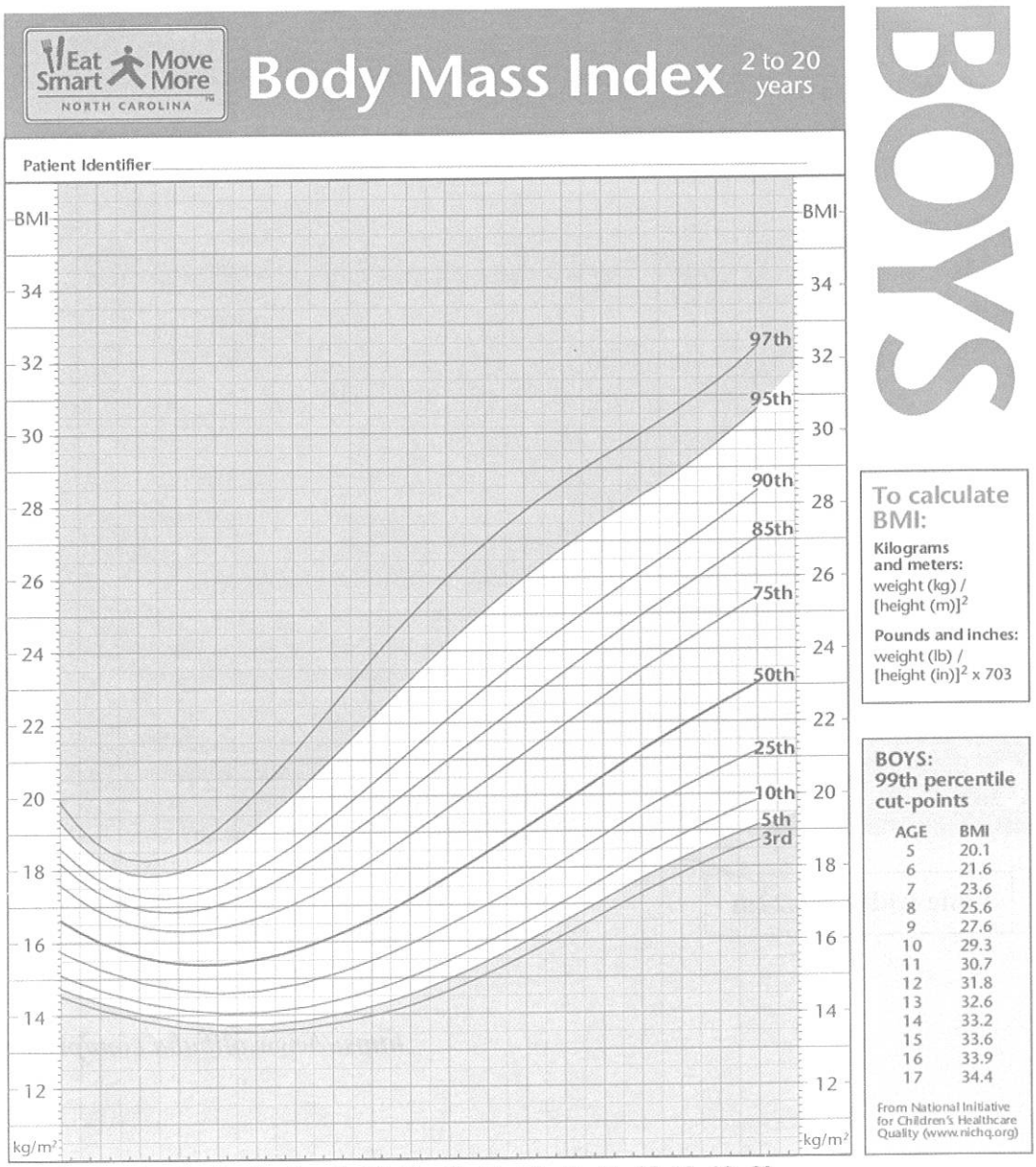
QUESTION 1.3



https://www.alibaba.com/product-detail/

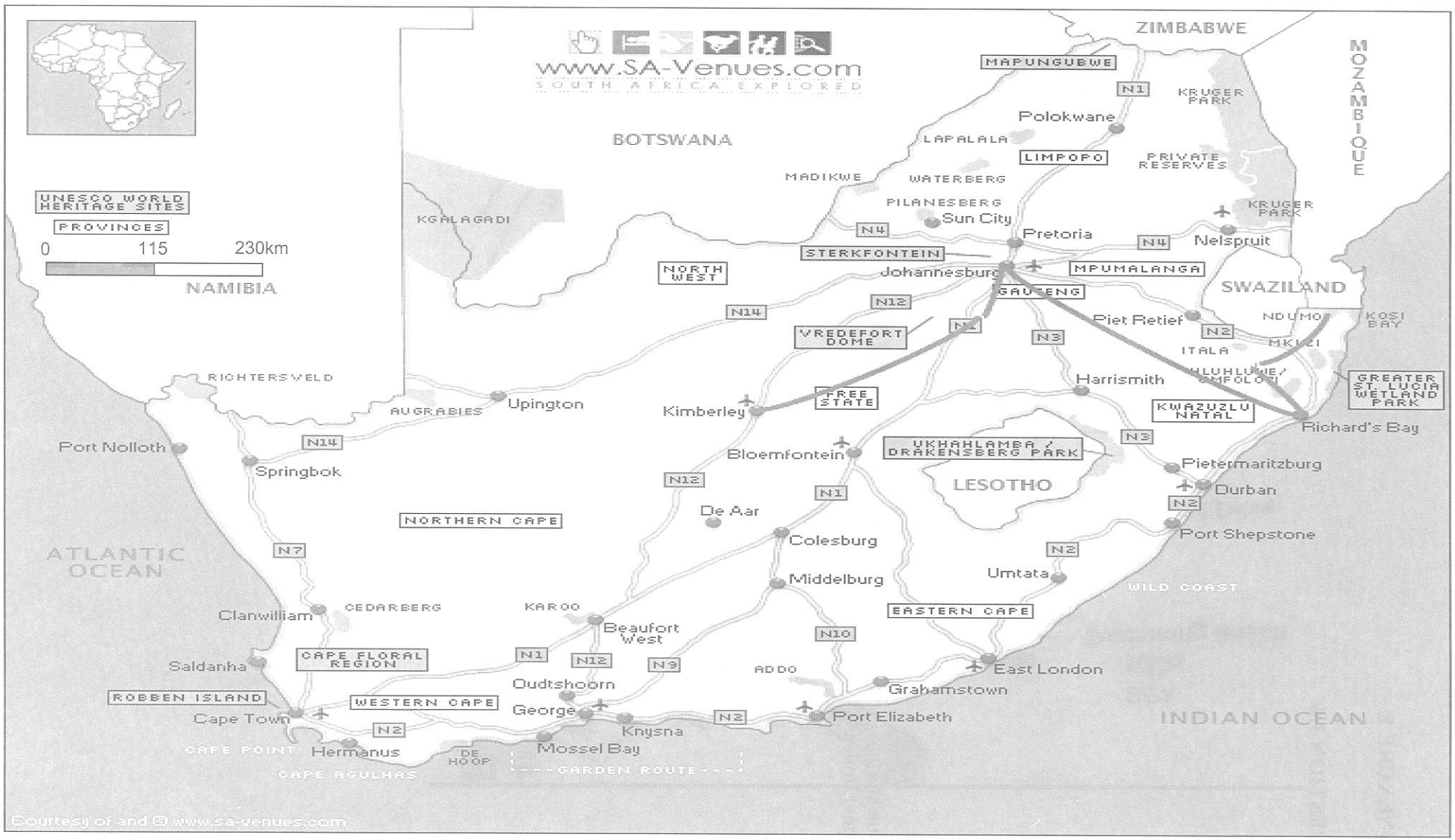
ANNEXURE C

QUESTION 2.2



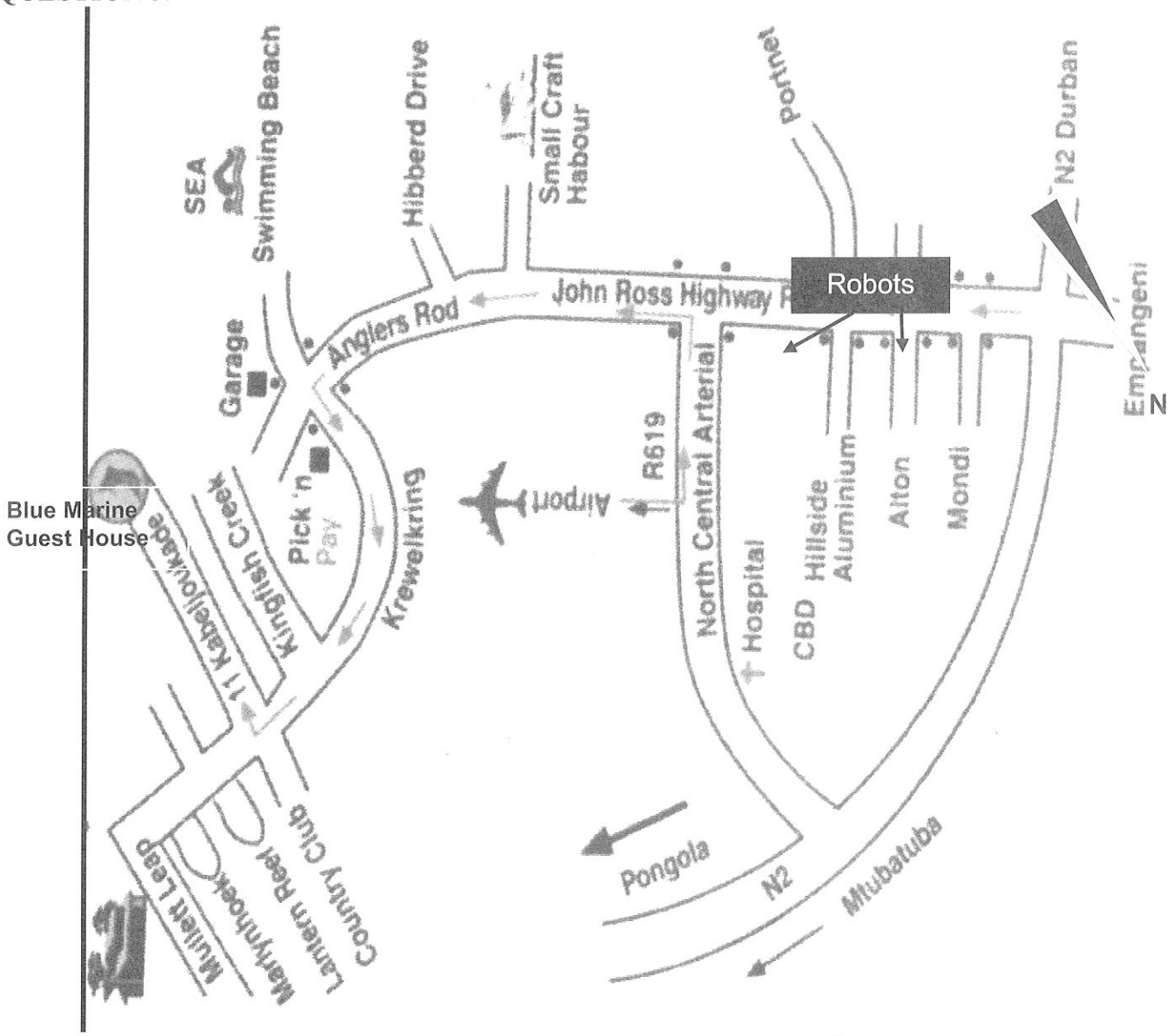
ANNEXURE D

QUESTION 3.1



ANNEXURE E

QUESTION 3.4



Source: www.pwc.co.za

ANNEXURE F

QUESTION 4.3

INCOME TAX: INDIVIVUALS AND TRUSTS 2018/2019		
Taxable income (R)	**Rate of Tax (R)**	**Tax bracket**
0 – 195 850	18% of taxable income	1
195 851 – 305 850	35 253 + 26% of taxable income above 195 850	2
305 851 – 423 300	63 853 + 31% of taxable income above 305 850	3
423 301 – 555 600	100 263 + 36% of taxable income above 423 300	4
555 601 – 708 310	147 891 + 39% of taxable income above 555 600	5
708 311 – 1 500 000	207 448 + 41% of taxable income above 708 310	6
1 500 001 and above	532 041 + 45% of taxable income above 1 500 000	7

TAX REBATES

Financial Year	2017/2018	2018/2019
Primary	R13 635	R14 067
Secondary (Persons 65 and older)	R 7 479	R7 713
Tertiary (Persons 75 and older)	R 2 493	R2 574

TAX THRESHOLDS

AGE	TAX THRESHOLD	
Below age 65	R 75 750	R78 150
Age 65 to below 75	R 117 300	R121 000
Age 75 and over	R 131 150	R135 300

MEDICAL TAX CREDIT RATES

	2017/2018 YEAR OF ASSESSMENT	2018/2019 YEAR OF ASSESSMENT
Taxpayer (per month)	R 303	R 310
First dependent (per month)	R 303	R 310
Each Additional Dependents (per month)	R 204	R 209

Source: www.umhlathuzemunicipality.gov.za

Education

KwaZulu-Natal Department of Education
REPUBLIC OF SOUTH AFRICA

MATHEMATICAL LITERACY P2

PREPARATORY EXAMINATION

MARKING GUIDELINE

SEPTEMBER 2018

NATIONAL SENIOR CERTIFICATE

GRADE 12

MARKS: 150

SYMBOL	EXPLANATION
A	Accuracy
C	Conversion
CA	Consistent accuracy
E	Explanation
F	deriving a formula
J	Justification
M	Method
MA	Method with accuracy
NPR	No Penalty for Rounding
O	Opinion/ reason/deduction/example/explanation
AO	Answer only full Marks
P	Penalty e.g. for no units, incorrect rounding etc.
R	Rounding off
RT/RG/RD/RM	Reading from a table/ graph/ diagram/ map
S	Simplification
SF	Correct substitution in a formula

This memorandum consists of 11 pages.

QUESTION 1 [35 MARKS]

NB: The paper will be marked out of 133 marks and be converted to 150 marks due to typographical errors in the following questions:

Question: 1.3.2, 1.3.3, 1.4.3 and omission of the height in 2.2.2

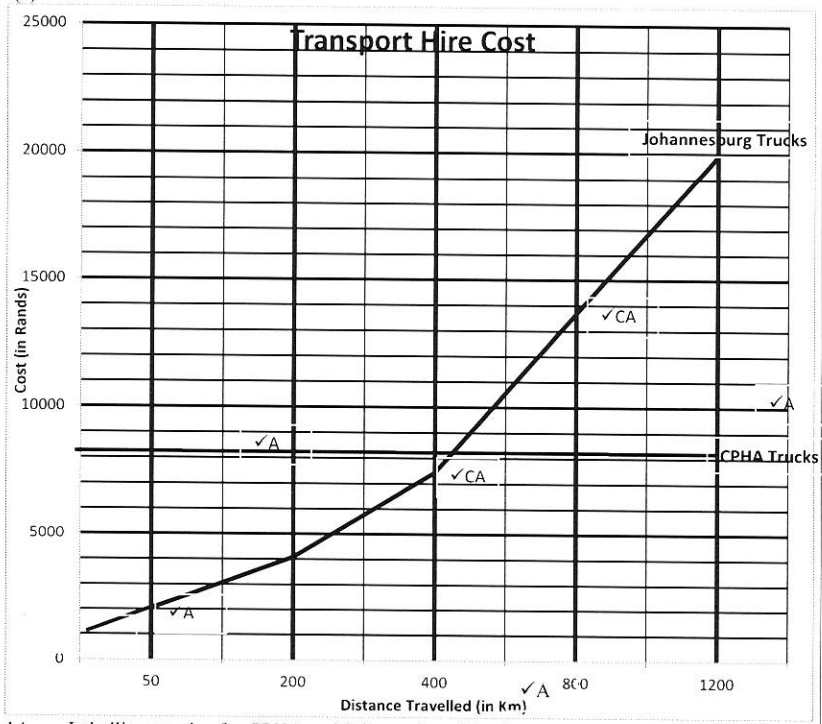
Ques	Solution	Explanation	T &L
1.1.1	✓RT ✓MA Stop order fee = R17,00 × 4 = R68,00✓A	1RT Reading from the table 1MA Multiplying correct values 1A Stop order fee (3)	F L2
1.1.2	✓SF Withdrawal fee (branch) = R40,00+(R1,80 per R100) = R40,00+(R1,80 × $\frac{R10000}{100}$ = R40,00 + R180 ✓S = R220 External debit = R16,50 Number of times = $\frac{R220}{R16,50}$ ✓M ✓CA = 13,33 ✓J It is correct it is more than 6 times. **OR** ✓SF Withdrawal fee (branch) = R40,00+(R1,80 per R100) = R40,00+(R1,80 × $\frac{R10000}{100}$ = R40,00 + R180 ✓S = R220 External Debit = R16,50 × 6 ✓M = R99✓A ✓J It is correct it is more than 6 times.	1SF Substituting correct values 1S Simplification 1M Dividing cost for withdrawing and debit 1CA number of times IJ Conclusion **OR** 1SF Using the correct formula 1S Simplification 1M Multiplying R16,50 x 6 1A external debit IJ Conclusion (5)	F L4
1.2.1	1 : 5 Lowest salary : 13 500 Lowest salary = $\frac{R13500}{5}$ ✓MA ✓A = R2 700,00	1MA Dividing correct values 1A Lowest salary (2)	F L2

1.2.2	Mean = $\frac{\text{sum of values}}{15}$ R5266,70 = $\frac{\text{sum of values}}{15}$ ✓M Sum of values = R15 × R5266,70 ✓M = R79 000,50 ✓A	1M Concept of a mean 1M Manipulation of equation 1A Sum of values (3)	F L3
1.3.1	✓M ✓M Radius (R) = 36,5m + 1,22 m × 6 + 0,05 m × 6 = 36,5m + 7,32 m + 0,3 m ✓S = 44,12 m ✓CA	1M Multiplying 1,22m by 6 1M Multiplying 0,05m by 6 1S Simplification 1CA Radius (4)	M L3
1.3.2	Circle (with Tartan) = Area of a big circle – Area with no Tartan ✓CA ✓M = 0,5 [3,142 × $(44,12m)^2$ – 3,142 × $(36,50m)^2$] = 0,5 (6116,136765 - 4185,9295) ✓S = 2669,36m^2 ✓CA	1CA Multiplying by 46,71 calculated in 1.3.1 1M Subtracting smaller circle 1S Simplification 1CA Area without tartan (4)	M L3
1.3.3	Total Track = Area of Part A × 2 + Area of Part B × 2 + Area of Part C × 2 ✓MA ✓M ✓MA ✓MA = (84,39m × 10,21m) × 2 + 2669,36 × 2 + 87,84 m^2 = 861,62m^2 + 5338,72 m^2 + 87,84 m^2 = 1723,24 m^2 + 5338,72 m^2 +87,84 m^2 ✓M = 7149,80 m^2 ✓✓CA	1M width of the rectangular part 1MA Multiplying correct values 1MA Multiplying correct values 1M Adding all areas 1CA Answer 1CA Unit in m^2 (6)	M L3
1.4.1	It is getting stronger ✓✓E **OR** It is growing in strength ✓✓E	2 E Explanation (2)	F L4
1.4.2	US $ = R11,556 ✓RD = 3 000 × R11,556 ✓MA = R34 660 ✓CA	1RD Correct exchange rate 1MA Multiplying correct values 1CA Cost of tartan material **Maximum mark 2 out of 3 if used R11,62** (3)	F L2

1.4.3	Total cost = R34 660 × $\frac{7149,8}{100}$ ✓M = R34 660 × 72✓MA = R2 496 096✓✓CA	1M Diving tartan needed by 100 1MA Multiplying correct values 1CA Total cost (3)	F L3
		[35]	

QUESTION 2 [34 MARKS]

2.1.1	✓F ✓F Cost per hour = R228 **OR** Cost = R228 × number of hours **OR** ✓F ✓F Cost = R228 n, where n is the number of hours	2 F Formula **OR** 2 F Formula **OR** 2 F Formula (2)	F L2
2.1.2	Cost of Johannesburg Trucks = R120 x number of hours + R12 x number of km + R400 x number of days ✓M ✓RT ✓MA = R120 x 36 + R12 x 1200 + R400 x 3 = R4320 + R14 400 + R1200 = R19 920 ✓CA	1M Number of hours 1RT Correct value 1 200 1MA multiplying R400 by 3 1CA Transport cost (4)	F L2

2.1.3	(a)  1A Labelling graphs for CPHA and Johannesburg Trucks 1A Labelling both axes 1CA Any 2 correct points for Johannesburg Trucks 1A Any correct straight line graph for CPHA 1A For line graphs 1CA Correct points of intersection (6)		F L3
	(b) Means that the transport costs are similar at that point ✓✓E **OR** Transport costs for both companies are the same / equal at that point. ✓✓E	2E Explanation **OR** 2E Explanation (2)	F L2

2.2.1	BMI = 27,8kg/m² ✓✓RD	2RD Reading from the graph **Accept 27 kg/ m²** (2)	DH L2
2.2.2	BMI = $\frac{\text{weight(kg)}}{(\text{height m}^2)}$ ✓SF 27,8kg/m² = $\frac{\text{weight (kg)}}{(1.8\text{m})^2}$ ✓A Weight (kg) = 27,8kg × 3,24 ✓M = 90kg ✓CA	1SF Substituting BMI 1A Correct height 1M Multiplying BMI by height 1CA Weight (4)	DH L3
2.2.3	BMI = $\frac{\text{weight(kg)}}{(\text{height m})^2}$ = $\frac{48\text{ (kg)}}{(1,3\text{m})^2}$ ✓SF BMI = 28,4kg/m² ✓S Her demand is not justified because the BMI is above 27,8kg/m² ✓✓J	1SF Correct substitution 1S Simplification 2J Justification (4)	DH L4
2.2.4	✓M Number of girls (above upper quartile) = 25% of 15 = 3,75 ✓A ≈ 4 girls ✓R	1M Concept of quartiles 1A Number of girls 1R Whole number (3) **ACCEPT 3 girls**	DH L3
2.3.1	The size of the shoe increases with the height of the athlete ✓✓ E	2E Explanation (2)	M L4
2.3.2	median = $\frac{6\frac{1}{2} + 7}{2}$ ✓MA = $\frac{13,5}{2}$ = 7 ✓A	1MA dividing correct values 1A Median (2)	DH L2
2.3.3	P(not less than 7) = $\frac{4}{8}$ ✓A ✓A = 0,5✓CA	1A Correct numerator 1A Correct denominator 1CA Decimal fraction (3)	P L3
		[34]	

QUESTION 3 [43 MARKS]

Ques	Solution	Explanation	T&L
3.1.1	38 mm : 230 km $\frac{38\text{ mm}}{38\text{ mm}} : \frac{230\,000\,000\text{ mm}}{38\text{ mm}}$ ✓C ✓M 1 : 6 052 631,578947368 ✓CA ✓R 1 : 6 100 000 **OR** 19 : 115 km ✓C $\frac{19}{19} = \frac{115\,000\,000}{19}$ ✓M ✓CA ✓R 1 : 6100 000	1C Converting to mm 1M Dividing by 38 mm 1CA Scale 1R Rounded answer **OR** 1C Converting to mm 1M Dividing by 19 mm 1CA Scale 1R Rounded answer (4)	MP L3
3.1.2	Durban to Johannesburg 1 : 6 100 000 52: actual distance ✓M Actual distance = 52 ×6 100 000 = 317 200 000 = 734,4 km✓C Total distance = 170km + 734km ✓M = 904,4km ✓CA No it is incorrect because the distance between Durban and Johannesburg is 734 not 758	1M Concept of scale 1C Conversion 1M Adding 2 distances 1CA Total distance (4)	MP L3
3.1.3	Distances in the chart are estimates ✓✓E **OR** The distance calculated using the scale is a straight line distance ✓✓E **OR** May be the scale is incorrect. ✓✓E **OR** Any other valid point	2E Explanation (2)	MP L4

3.2.1	Height = 33cm × 3 ✓MA = 99cm ✓CA	1MA Multiplying correct values 1CA Height (2) **Accept 1,26 m**	M L2
3.2.2	Volume of the crate = length × width × height ✓SF ✓M = (32cm × 3 + 6cm) × 1,1m x 1,26m ✓C = 1,02m × 1,1m × 1,26m ✓S = 1,41m^3 ✓CA ∴ the volume of the wooden crate is not approximately 0,9m^3 ✓CA	**CA from 3.2.1** 1SF Correct substitution 1M Adding 6cm (length) 1C Converting to m 1 S Simplification 1CA Volume 1CA conclusion (6)	M L4
3.2.3	P(Green or Red) = $\frac{1}{9} + \frac{2}{9}$ ✓M = $\frac{3}{9}$ ✓S = $\frac{1}{3}$ ✓CA **OR** 0,33 **OR** 33,33%	1M Concept of probability 1S Simplification 1CA Probability (3)	P L3
3.3.1	Income (local sms) = $\frac{\text{R1,00}}{\text{R1,50}} \times 100\%$ ✓MA = 66,67% ✓CA ✓M Income (international sms) = $\frac{\text{R1,26}}{\text{R 3,00}} \times 100\%$ = 42%✓CA True, because it receives 66,67% as compared to 42% ✓✓J	1M Concept of percentage 1CA Simplification 1M Subtracting Vodacom costs 1CA Percentage 2J Justification (6)	F L4

3.3.2	Monthly average income(local) = 2 000 × R1,00 ✓M = R2 000 Monthly average income(international) = 60 × R1,26 ✓M = R75,60 Average income after 3 months = (R2 000 + R75.60) = R2075.60 ×12 ✓M = R24 907,20 ✓CA No they did not make the target. ✓J	1M 1M 1M 1CA 1J	Multiplying R1 by 2 000 Multiplying R1,26 by 60 Multiplying the total by 12 Average income Justification	(5)	DH L4
3.3.3	Chances = $\frac{60}{2060} \times 100\%$ ✓MA = 2,9% ✓CA The statement is incorrect, chances are more than 2% ✓✓J	1MA 1CA 2J	Dividing correct values Chances in % Justification	(4)	P L4
3.4.1	4 sets of robots ✓✓A	2A	Sets of robots	(2)	MP L2
3.4.2	South East ✓✓A	2A	General direction	(2)	MP L2
3.4.3	Join North Central Arterial ✓RM At the robots turn left at John Ross Highway cum Anglers Road. ✓RM Turn left at Krewelkring street Pass the first street after passing Pick' Pay and turn right Kabeljoukade The destination is on Kabeljoukade. ✓RM	1RM 1RM 1RM	Joining North Central Any 2 milestones mentioned Finding the destination.	(3)	MP L2
				[43]	

QUESTION 4 [38 MARKS]

Ques	Solution	Explanation	T &L
4.1.1	Range of pedestrian deaths = 5 800-3 800 ✓M = 2 000 ✓CA Range of drivers deaths = 4 700 – 3 700 = 1 000 ✓A The pedestrians have the highest range as compared to the drivers' fatalities meaning the lowest total differ by 2000 from the highest total. ✓✓E **OR** Any other correct explanation.	1M Concept of the range of pedestrians 1CA Range of pedestrian **Accept a range between 2 000 to 2 100** 1A Range of drivers fatalities **Accept a range between 1 000 to 1 075** 2E Explanation (5)	DH L4
4.1.2	✓A Yes, because Q1 of passengers fatalities is 3900 meaning that 75% of total scores is above 3900 ✓✓E	1A Yes 2E Explanation (3)	DH L4
4.2.1	KZN Fatalities = $\frac{19}{100} \times 14\,071$ ✓M = 2673,49 = 2 673 ✓A	1MA Multiplying the correct values 1A KZN road fatalities (2)	DH L3
4.2.2	Northern Cape Deaths = $\frac{3}{100} \times 14071$ ✓M = 422 ✓A Deaths per provincial population = $\frac{422}{1213996} \times 100\%$ ✓M = 0.03% ✓CA Yes it is true there are more fatalities in Northern Cape than in Gauteng because Gauteng has 0,02% whereas Northern has 0,03% . ✓✓J	1M Concept of a pie 1A Northern Cape fatalities 1M Dividing fatalities by the population of the province 1CA Percentage 2J Justification (6)	DH L4

4.3.1	Total hours = 8 hours + 6 hours ✓MA = 14 hours ✓A	1MA 1A	Adding correct values Answer **AO** (2)	M L3
4.3.2	Total cost = (2 × R30,70)+(12 × R35,00) ✓MA = R61,40+ R420,00 ✓M = R481,40 = R481,40 + VAT = R481,40 + R72,21 ✓M = R553,61 ✓CA	1MA 1M 1CA	Multiplying by 2 hours and 12 hours Adding VAT Total cost (4)	M L3
4.3.3	✓M ✓A Total cost = 12 × R40,25 (incl VAT) = R483,00 ✓S Amount saved = R553,61 – R483,00 ✓M = R70,61 It is true more than R70, 00 was going to be saved. ✓J	1A 1M 1S 1M 1J	VAT amount Multiplying by 12 Simplification Subtracting from the original amount Justification (5)	M L4
4.4.1	✓A Rebate is a discount given to taxpayers for paying tax ✓A whereas the tax threshold is a minimum income a person must receive in order to start paying tax.	1A 1A	Concept of rebate Concept of threshold (2)	F L4
4.4.2	Income tax = R63 853 + 31% of the amount above R305 850 ✓A = R63 853 + 31% × R15 517,20 ✓A = R68 663,33 = R68 663,33 – R14 067 (rebate) ✓M = R54 596,33 – (R310 × 12) (medical tax credit) ✓M = R50 876.33 ✓CA	1A 1A 1M 1M 1CA	Correct bracket Amount above Subtracting rebate Subtracting medical credit Income tax (5)	F L3
4.4.3	Amount saved (rebate) = R14 067 – R13 635 = R432 ✓A Medical aid credit = R310 – R303 = R7,00 × 12 ✓M = R84 Total saved = R432 + R84 = R516,00 ✓A Yes he was correct, amount saved is around R500. ✓J	1A 1M 1A 1J	Difference of rebates Medical credit × 12 Total saved Justification (4)	F L4
			[38]	

TOTAL MARKS: 150