education

Department:
Education
PROVINCE OF KWAZULU-NATAL

NATIONAL SENIOR CERTIFICATE

GRADE 12

MATHEMATICAL LITERACY

COMMON TEST

MARCH 2020

MARKS: 100

TIME: 2 hours

This question paper consists of 9 pages.

INSTRUCTIONS AND INFORMATION

1. This question paper consists of FOUR questions. Answer ALL the questions.
2. Number the answers correctly according to the numbering system used in this question paper.
3. Start EACH question on a NEW page.
4. You may use an approved calculator (non-programmable and non-graphical), unless stated otherwise.
5. Show ALL calculations clearly.
6. Round off ALL final answers appropriately according to the given context, unless stated otherwise.
7. Indicate units of measurement, where applicable.
8. Diagrams and graphs are NOT necessarily drawn to scale, unless stated otherwise.
9. Write neatly and legibly.

QUESTION 1

1.1

Mrs Molefe buys raw mealies from the farmer at R7,00 each. The farmer delivers mealies to her home for free at 06:00. She cooks the mealies for one hour fifty minutes. She sells them at the taxi rank for R13,00 each. She sells on Monday to Saturday. A single trip to the taxi rank costs R15,00.

Use the information above and the February calendar below to answer the questions that follow.

PHOTO OF RAW MEALIES

Source: www.shutterstock.com

FEBRUARY CALENDAR 2020

SUN	MON	TUE	WED	THU	FRI	SAT
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29

1.1.1 Determine the number of days that Mrs Molefe sold mealies at the taxi rank in February 2020. (2)

1.1.2 After the delivery, it takes Mrs Molefe 20 minutes to prepare raw mealies for cooking. At what time will the mealies be ready for eating? (3)

1.1.3 Calculate the monthly taxi fare for February 2020. (4)

1.1.4 Calculate the profit from the sale of one mealie. (2)

1.1.5 Define the term ***break-even.*** (2)

1.1.6 Write down the formula for calculating the cost per day in the form:

Cost = ... + ... × ..... (2)

1.1.7 Write down the formula for calculating the income per day in the form:

Income = ... × ..... (2)

1.1.8 Calculate the profit made if she bought 70 raw mealies and only sells 40. (6)

1.2

Mr Molefe is a fisherman. Before he goes to the sea shore to fish, he studies the tide table. Below are the two tide tables for Durban showing tides for Tuesday 28/01/2020 and Wednesday 29/01/2020.

Use the information above and TABLE 1 below to answer the following questions.

TABLE 1: Showing Durban tide tables for 28/01/2020 and 29/01/2020

28/01/2020				**29/01/2020**			
Tide	Time	Height		Tide	Time	Height	
High tide	5:44 am	1,91 m		High tide	6:13 am	1,86 m	
Low tide	11: 49 am	0,43 m		Low tide	12:18 pm	0,50 m	
High tide	5: 49 pm	1,8 m		High tide	6:17 pm	1,76 m	
Low tide	11:59 pm	0,35 m		Low tide	–	–	
Sunrise 5:20 am	Sunset 6:56 pm	Moonrise 8:17am	Moonset 9:21pm	Sunrise 5:21am	Sunset 6:55pm	Moonrise 9:10am	Moonset 9:51pm

Source: ***www.tide-forecast.com***

1.2.1 Calculate the difference in time between the high tide and low tide in the morning on 28 January 2020. (2)

1.2.2 Write down the time for a low tide in the afternoon of 29 January 2020 in a 24–hour format. (2)

1.2.3 Convert the height of the high tide to feet (ft) on 28 January 2020 in the morning.

Note: 1 foot = 30,48 cm (4)

[31]

QUESTION 2

2.1

The Du Toit family stays in Newcastle. They decided to change the electricity from the metered one to domestic prepaid. Below is a table of the Newcastle electricity tariffs for 2017/2018 and 2018/2019. Mr van Zyl is the Du Toit's neighbour.

Note: The municipality financial year of services starts on 1 July of the current

Use the information above and TABLE 2 below to answer the questions that follow.

TABLE 2: Showing Newcastle electricity tariffs for domestic in 2017/2018 and 2018/2019.

Block	Tariff/ kWh in cents excluding 15% VAT 2017/2018	Tariff/ kWh in cents excluding 15% VAT 2018/2019
Block 1: (0-50 kWh)	96,93 cents	104,68 cents
Block 2: (from 50 – 350 kWh)	116,88 cents	126,53 cents
Block 3: (from 350 - 600 kWh)	124,92 cents	134,91 cents
Block 4: (> 600 kWh)	131,57 cents	142,10 cents

Source: ***www.newcastlemunicipality.gov.za***

2.1.1 Determine the number of kilowatt hours (Kwh) in block 1 and block 2. (2)

2.1.2 Write the ratio of kilowatt hours of block 1 to block 2 in simplest form . (2)

2.1.3 In May 2018, the family bought electricity for R600,00 including VAT.

(a) Calculate the VAT amount. (3)
(b) Determine the number of kilowatt hours (kWh) they received. (6)

2.1.4 In May 2019, Mr van Zyl's family consumed 503 kWh of electricity. Calculate the total amount including VAT that this family will pay. (6)

[19]

QUESTION 3

3.1

Lindani who is 45 years old, is married with 3 children. He earns a monthly taxable income of R32 500. He contributes to a medical aid scheme for him and his family. The Adapted Tax table for 2019/2020 is shown below.

TABLE 3: TAX RATES FOR INDIVIDUALS FOR THE 2019/2020 TAX YEAR

Taxable Income	Rates of tax
0 - 195 850	18 % of taxable income
195 851 - 305 850	35 253 + 26% of taxable income above 195 850
305 851 - 423 300	63 853 + 31% of taxable income above 305 850
423 301 - 555 600	100 263 + 36% of taxable income above 423 300
Rebates	
Primary Rebate	R14 220
Secondary (Persons 65 and older)	R7 794
Tertiary (Persons 75 and older)	R2 601
Medical Aid Tax Credits per month	
Main member	R310
First dependant	R310
Each additional dependant	R209

[Adapted source: www.sars.org]

Use TABLE 3 and the information above to answer the questions that follow.

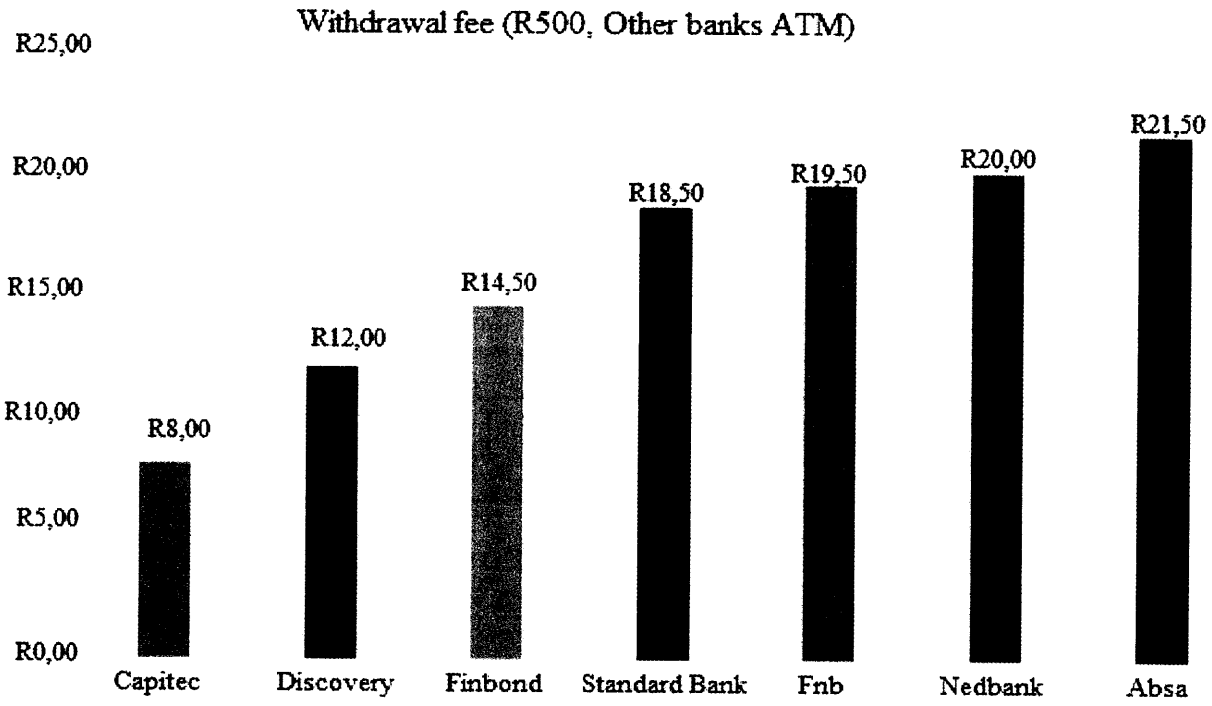
3.1.1 Calculate Lindani's annual taxable income. (2)

3.1.2 Determine Lindani's total medical aid tax credit for the year. (3)

3.1.3 Hence, calculate his monthly income tax for the year 2019/2020. (8)

3.2

The graph below shows the 2020 Bank withdrawal fees for R500 charged by the different Banks in South Africa.



[Adapted source: www.busstech.co.za]

Use the graph and the information above to answer the questions that follow:

3.2.1 Identify the price difference between the most expensive and the least expensive withdrawal fee. Give a reason for this price difference. (3)

3.2.2 FNB charges a fixed bank fee plus R1,90 for every R100 withdrawn. Use the graph to calculate the fixed bank fee. (4)

3.2.3 Determine the percentage change in the withdrawal fee for Capitec bank, if the cost to withdraw R500 in 2019 was R8,75.

You may use the formula:

$$\% \text{ change} = \frac{\text{New} - \text{original}}{\text{original}} \times 100$$ (3)

3.2.4 Absa charges R11,50 + R2 for every R100 withdrawn. A customer withdrew R2 000. Explain why the calculation below is incorrect. Hence provide the correct calculation.

Total withdrawal fee for Absa Bank = R2000 ÷ 500 = 4 = 4 × R21,50 = R86

(4)

[27]

QUESTION 4

4.1

The Survey conducted by Statistics South Africa indicate specific types of crime committed from 2014 to 2019.

TABLE 4: NUMBER OF INDIVIDUALS AGED 16 AND OLDER THAT EXPERIENCED THE FOLLOWING CRIMES FROM 2014 TO 2019.

Statistic	2014/15	2015/16	2016/17	2017/18	2018/19
Theft of personal property	2 095 571	1 894 495	1 762 131	1 844 367	2 343 507
Street robbery	706 227	678 653	738 462	735 298	1 125 972
Assault excluding sexual assault	724 435	682 924	590 281	600 153	598 948
Consumer fraud	254 351	233 182	199 681	146 536	172 743
Hijacking	194 976	161 800	158 990	**A**	198 199
Sexual offences	127 935	117 282	134 134	126 070	97 938

[Adapted source: www.statssa.gov.za.]

Use TABLE 4 and the information above to answer the questions that follow:

4.1.1 Calculate the total number of individuals affected by assault including sexual offences in 2018/019. (2)

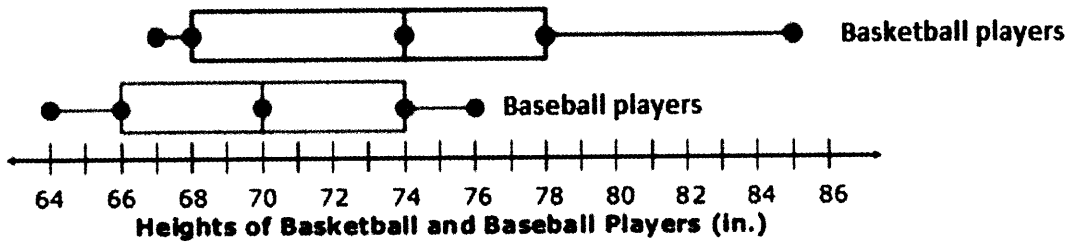
4.1.2 Determine the mean number of individuals affected by Theft of personal property from 2014 to 2019. (3)

4.1.3 The range for individuals affected by hijackings is 46 169.
Determine **A**, the minimum number of individuals affected by hijacking in 2017/18. (3)

4.1.4 Describe the trend in street robbery from 2014 to 2019. (2)

4.2

The box and whisker plot below shows the heights of Basketball players and Baseball players in inches.



[Adapted source: www.slideshow.net]

Use the information above to answer the following questions:

4.2.1 75% of the Baseball team's height is the same as 50% of the Basketball team's.
Determine the height of the players. (2)

4.2.2 One of the coaches claimed that the difference in the maximum heights of the players is 3 times more than the difference in the minimum heights of the players.

Verify, if this claim is correct, using a calculation. (5)

4.2.3 Determine the inter quartile range for the Baseball players. Explain the significance of the IQR of the Baseball players. (3)

4.2.4 Which teams heights' are more consistent and why? (3)
[23]

TOTAL: [100]

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MARKING GUIDELINE

MARCH 2020

MARKS: 100

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

This marking guideline consists of 7 pages.

QUESTION 1 [31 MARKS]			
Ques	**Solution**	**Explanation**	**T&L**
1.1.1	25 days ✓✓RT	2 RT reading from the table (2)	M L1
1.1.2	Prep. Time: 06:00 + 20 minutes ✓M = 06:20 + 1 hour 50 minutes ✓M Finishing time = 08:10 ✓CA	1M adding 20 minutes 1M adding cooking time 1CA time **AO** (3)	M L1
1.1.3	Return trip = R15,00 × 2 ✓M = R30,00 ✓A Monthly fare = R30,00 × 25 days ✓M = R750,00 ✓CA	1M multiplying by 2 1A fare 1M multiplication 1CA monthly fare (4)	M L1
1.1.4	Profit = R13,00 – R7,00 ✓M = R6,00 ✓A	1M subtraction 1A profit **AO** (2)	F L1
1.1.5	Break-even is when there is no profit and no loss. ✓✓E **OR** Break-even is when the cost is equal to the income. ✓✓E	2E explanation **OR** 2E explanation (2)	F L1
1.1.6	✓CA Cost = R30,00 + R7,00 × number of raw mealies ✓CA	1CA fixed taxi fare 1CA formula (2)	F L1
1.1.7	Income = R13,00 × number of raw mealies sold. ✓✓F	2F formula (2)	F L1
1.1.8	Cost = R30,00 +(R7,00 × number of raw mealies) = R30,00 + R7,00 × 70 ✓CA = R520,00 ✓CA Income = R13,00 × number of raw mealies = R13,00 × 40 ✓MA = R520,00 ✓A Profit = R520,00 – R520,00 ✓M = R0,00 ✓CA	 1CA substitution 1CA cost 1MA multiplying 40 by R13,00 1A income 1M subtraction 1CA no profit **Accept if profit is not calculated award 2 marks for no profit** (6)	F L2
1.2.1	Difference = 11:49 – 5:44 ✓MA = 6 hours 05 minutes ✓A **OR** 5:44 – 6:44 (1 hour) 6:44 – 7:44 (1 hour) 7:44 – 8:44 (1 hour) 8:44 – 9:44 (1 hour) ✓MA 9:44 – 10: 44 (1 hour) 10:44 – 11:44 (1 hour) 11:44 = 11:49 (5 minutes) Difference : 6 hours 05 minutes ✓A	1MA subtraction 1A difference **OR** 1MA adding 1A difference **AO** (2)	M L2

1.2.2	Time of low tide 12:18 ✓✓A	2A time in 24-hour format (2)	M L2
1.2.3	Height = 1,91 m ✓M 1 foot = 30,48 cm ÷ 100 ✓C 1 ft = 0,3048 m ft = 1,91 m ft = $\frac{1,91\text{m}}{0,3048\text{ m}}$ ✓M = 6,266…….. ≈ 6,27 ft ✓CA **OR** Height = 1,91 m ✓M 1 foot = 30,48 cm 1,91 m × 100 ✓C = 191 cm ft = $\frac{191\text{cm}}{30,48\text{ cm}}$ ✓M = 6,266…….. ≈ 6,27 ft ✓CA	1M identifying correct height 1C converting cm to m 1M dividing by 0,3048 1CA height in ft **OR** 1M identifying correct height 1C converting m to cm 1M dividing by 30,48 1CA height in ft (4)	M L2
			[31]

QUESTION 2 [19 MARKS]			
2.1.1	No. of kWh in Block 1: 50 kWh – 0 kWh= 50 kWh ✓A No. of kWh in Block 2: 350 kWh – 50 kWh = 300 kWh ✓A	1A correct no. of kWh 1A correct no. of kWh **AO** **Accept 350 kWh** (2)	F L2
2.1.2	Ratio 50 : 300 ✓MA 1 : 6 ✓S	**CA from 2.1.1** 1MA ratio in correct order 1S simplification **AO** (2)	F L1
2.1.3 (a)	Amount excluding VAT = $\frac{R600,00}{1,15}$ ✓M = R521,74 VAT amount = R600,00 – R521,74 ✓M = R78,26 ✓A **OR** VAT amount = $\frac{15}{115} \times$ R600,00 ✓✓M = R78,26 ✓A **OR** Amount excluding VAT = $\frac{100}{115} \times$ R600,00 ✓M = R521,74 VAT amount = R600,00 – R521,74 ✓M = R78,26 ✓A	1M dividing by 1,15 1M subtraction 1A VAT amount **OR** 2M dividing & multiplying 1A VAT amount **OR** 1M multiplying by $\frac{100}{115}$ 1M subtraction 1A VAT amount (3)	F L2
(b)	No. of kWh = R521,74 – R48,465 (50 kWh) ✓C R473,275 – R350,64 (300 kWh) ✓M $\frac{R122,635}{1,2492}$ ✓M = 98,1708….. ≈98,17✓CA Total no. of kWh = 50 + 300 + 98,17 ✓M = 448,17 ✓CA	1C converting cents to rands 1M subtraction 1M dividing by rate in block 3 1CA number of kWh 1M adding 1CA no. of kWh (6)	F L2

2.1.4	Amount = (50 kWh × $\frac{104,68}{100}$) + (300 kWh × $\frac{126,53}{100}$ ✓C +(✓A 153 kWh × $\frac{134,91}{100}$) = R52,34 + R379,59 + R206,4123 ✓S = R638,3423 ✓A Amount including VAT = R638,3423 × 1,15 ✓M = R734,09 ✓CA **OR** Amount = (50 kWh × $\frac{104,68}{100}$) + (300 kWh × $\frac{126,53}{100}$ ✓C) + (153 kWh ✓A × $\frac{134,91}{100}$) = R52,34 + R379,59 + R206,4123 ✓S = R638,3423 ✓A Amount including VAT = R638,3423 + (15% × R638,3423) ✓M = R734,09 ✓CA **OR** Amount = (50 kWh × $\frac{104,68}{100}$) + (300 kWh × $\frac{126,53}{100}$ ✓C) + (153 kWh ✓A × $\frac{134,91}{100}$) = R52,34 + R379,59 + R206,4123 ✓S = R638,3423 ✓A VAT = 15% × R638,3423 = R95,75 Amount including VAT = R638,3423 + R95,75 ✓M = R734,09 ✓CA	1C converting cents to rands 1A no. of kWh in block 3 1S simplification 1A amount 1M multiplying by 1,15 1CA amount **OR** 1C converting cents to rands 1A no. of kWh in block 3 1S simplification 1A amount 1M adding 15% 1CA amount **OR** 1C converting cents to rands 1A no. of kWh in block 3 1S simplification 1A amount 1M adding VAT 1CA amount **[maximum 3 marks if used the wrong column R678,41**] (6)	F L2
			[19]

QUESTION 3 [27 MARKS]

Ques	Solution	Explanation	T &L
3.1.1	Annual Taxable income =R 32 500 × 12 ✓MA = R390 000 ✓A	1MA multiplying by 12 1A annual taxable income (2)	F L2
3.1.2	Total med aid tax credit= R310+R310+R209+R209+R209✓MA = R 1247 = R 1247×12✓MA = R 14 964✓CA	1MA adding correct values 1MA multiplying by 12 1CA medical aid tax credit (3)	F L3
3.1.3	✓A Monthly tax = R63 853 + 0,31(R390 000 – R305 850)✓SF = R89 939,50✓S = R89 939,50 – (R14 220) ✓MA = R75 719,50✓CA = R75 719,50 – (R14 964) ✓CA = R60 755,50 = R60 755,50 ÷ 12 ✓MA = R5062,96 ✓CA	1A correct tax bracket 1SF correct substitution 1S simplification 1MA subtracting rebate 1CA answer 1CA subtracting medical credit from **Q3.1.2** 1MA dividing by 12 1CA monthly tax (8)	F L3
3.2.1	Difference in price = R21,50 – R8 ✓RG = R13,50✓A Capitec bank fee rates are lower than Absa. ✓O	1RG subtracting correct values 1A difference in price 1O opinion (3)	F L4
3.2.2	Fixed bank fee = R500÷100 ✓MA = 5 = 5 × R1.90✓MA = R9.50 = R19,50 – 9.50✓CA = R10✓CA	1MA dividing by 100 1MA multiplying by R1,90 1CA subtracting answer 1CA fixed bank fee (4)	F L3
3.2.3	✓1RG % Change = $\frac{8,00-8,75}{8,75} \times 100$ ✓MA = – 8,57%✓CA	1RG and subtraction 1MA dividing by 8,75 1CA % decrease (3)	F L2
3.2.4	Withdrawal fee has a fixed cost of R11,50 therefore method is incorrect✓O Withdrawal fee = R2000 ÷ 100✓MA = 20 = R11,50 + (R2×20) ✓SF = R51,50✓A	1O opinion 1MA dividing by 100 1SF substitution into formula 1A withdrawal fee (4)	F L4
		[27]	

QUESTION 4 [23 MARKS]			
4.1.1	Total number of individuals affected = 598 948 + 97 938✓RT = 696 886✓A	1RT correct values 1A total (2)	DH L2
4.1.2	Mean =2 095 571+1 894 495+1 762 131+1 844 367+2 343 507✓MA =9 940 071 =9 940 071 ÷ 5✓MA =1 988 014,20 ≈ 1 988 014 ✓CA	 1MA adding correct values 1MA dividing by 5 1CA mean (3)	DH L2
4.1.3	Range = Max - Min✓MA 46 169 = 198 199 – A✓SF 198 199 – 46 169 =152 030✓A	1MA concept of range 1SF correct substitution 1A value of A (3)	DH L3
4.1.4	It is fluctuating over a period of time✓✓O **OR** Increasing and decreasing over a period of time✓✓O	2O opinion **OR** 2O opinion (2)	DH L4
4.2.1	74 inches✓✓RG	2RG reading correct value (2)	DH L2
4.2.2	Difference in Max heights = 85 - 76 = 9 inches✓RG Difference in Min heights = 67 -64 = 3 inches✓RG Max height is 3 times more = 9 ÷ 3✓MA =3✓CA Claim is correct. ✓O	1RG difference in maximum heights 1RG difference in minimum heights 1MA dividing by 3 1CA max height 1O opinion (5)	DH L3
4.2.3	IQR = 74 – 66 ✓RG = 8 inches ✓CA The middle 50% of player's heights are concentrated between 66 and 74 inches✓O	1RG subtracting correct values 1CA IQR 1O opinion (3)	DH L4
4.2.4	Baseball ✓A IQR and range for baseball team is smaller than that of basketball team✓✓O	1A correct team 2O opinion (3)	DH L4
		[23]	

TOTAL: [100]