**Province of the
EASTERN CAPE
EDUCATION**

**NATIONAL
SENIOR CERTIFICATE**

GRADE 11

NOVEMBER 2018

MATHEMATICAL LITERACY P1

MARKS: 100

TIME: 2 hours

IMLIT1

This question paper consists of 9 pages.

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

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

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

3.   An approved calculator (non-programmable and non-graphical) may be used, unless stated otherwise.

4.   Maps and diagrams have not been drawn to scale, unless stated otherwise.

5.   Round off ALL the final answers according to the context used, unless stated otherwise.

6.   Indicate units of measurement, where applicable.

7.   Start EACH question on a NEW page.

8.   Show ALL calculations clearly.

9.   Write neatly and legibly.

                                        Please turn over

QUESTION 1

1.1 | A house in East London was for sale at a price of R2 578 799,00. A deposit of R386 819, 85 was required and the balance payable in equal monthly instalments for 20 years.

1.1.1 Write the sale price of the house in words. (2)

1.1.2 Express the deposit amount as a percentage of the sale price. (3)

1.1.3 Ben decided to bank the deposit amount at **QR BANK**. Use the information below to calculate the transaction cost of the deposit.

Transaction	Rate	
Charge for deposits	R5,75 + R1,10 per **R100** or part thereof	(3)

1.2 TABLE 1 below shows Babu's running time during a 2015 Comrade Marathon at various points along the route.

TABLE 1		**Athlete: Babu**
Points on the route	**Distance in kilometres**	**Time (hours, minutes, seconds)**
Lion Park	15,9	01:05:26
Camperdown	26,9	01:50:39
Halfway	45	03:05:14
Pinetown	68,9	04:54:45
Mayville	82,3	06:02:45
Finish	89,3	06:37:30

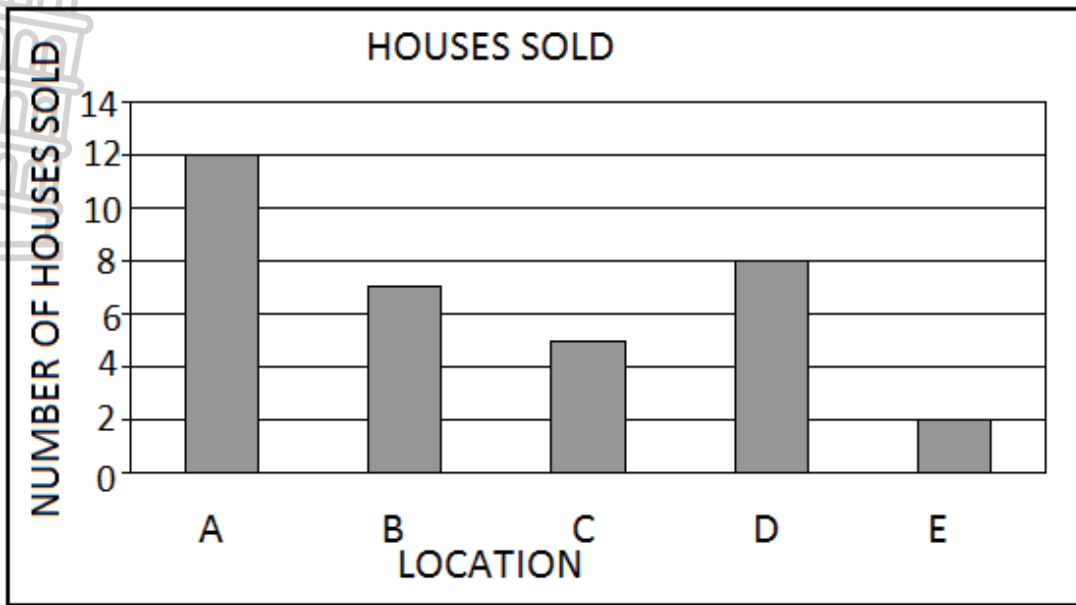Use the information in TABLE 1 to answer the questions that follow:

1.2.1 Determine the distance from Camperdown to Mayville. (3)

1.2.2 Calculate how long it took Babu to run from the halfway mark to Pinetown. (2)

1.2.3 Convert the distance to Pinetown to metres. (2)

MATHEMATICAL LITERACY P1

1.3 The graph below shows the number of houses sold in different locations **A, B**, **C, D** and **E**.

Use the graph above to answer the following questions.

1.3.1 Arrange the number of houses sold in descending order. (2)

1.3.2 Write down the type of graph that was used to represent the information above. (2)

1.3.3 Calculate the total number of houses that was sold in all the locations. (2)

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QUESTION 2

2.1 Ms Fasi started a small business by selling pies at schools and factories close to her workplace. She pays rent of R1 500 per month. It costs her R5,00 to make and package a pie and she sells them at R15,00 each.

Study the table below and answer the questions that follow.

TABLE 2: THE COST AND INCOME FOR THE BUSINESS

Number of Pies	0	50	100	150	250	350
Total Cost in Rand	1 500	**A**	2 000	2 250	2 750	3 250
Income in Rand	0	750	1 500	2 250	**B**	5 250

The following formulae are used to calculate the cost and income respectively:

Cost = R1 500 + R5,00 $\times$ n
Income = R15,00 $\times$ n; where n represents the number of pies

2.1.1 Use the table to determine Ms Fasi's break-even amount. (2)

2.1.2 Calculate the value of **A.** (3)

2.1.3 Show by means of calculations that the value of **B** is R3 750. (2)

2.1.4 Calculate the profit if 350 pies are sold. (3)

2.2 Ms Fasi borrowed R60 000 from Women's Bank to start her small business and agreed to pay back the money at an interest rate of 8,5% that is compounded annually for 2 years.

2.2.1 Calculate the amount of the interest that was added at the end of the first year. (2)

2.2.2 Determine the total amount that Ms Fasi paid back to the bank after 2 years. (5)

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2.3 TABLE 3 shows the Domestic Water Tariffs for 2018 used by the local municipality where Ms Fasi lives.
TABLE 4 shows the meter readings by the local municipality which indicates the amount of water the Fasi family used for May and June 2018.

TABLE 3

	Number of kilolitres	Cost per kilolitre (kℓ) excluding VAT
1	0 – 6 kℓ	0
2	Above 6 kℓ – less than 30 kℓ	R10,02
3	30 kℓ – less than 60 kℓ	R12,28
4	60 kℓ and above	R16,70
+ Additional charge if more than 6 kℓ used		R80,70

TABLE 4: Water meter readings for Account Number 40101607 during May and June.

1/05/2018	(kℓ)	0561
1/06/2018	(kℓ)	0587

2.3.1 Calculate the cost of the water usage for May 2018 excluding VAT. (5)

2.3.2 Calculate the VAT amount that is charged on the additional charge of R80,70. **(VALUE ADDED TAX = 15%)** (3)

2.4 The average inflation rates for the period 2016 to 2017 are shown in the following table.

	2016	**2017**
Average inflation rate	4,51%	6,59%
Cost of a brown bread	R9,99	**A**

2.4.1 Explain the meaning of the term *inflation rate*. (2)

2.4.2 Calculate the cost of a loaf of brown bread in 2017 by using the average inflation rates that are given in the table above. (2)

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QUESTION 3

3.1 Study the weather forecast for Cape Town and Pretoria on the 20th of May 2018.

Forecast	Cape Town	Pretoria
Sunrise	07:35	06:40
Sunset	17:50	17:27
Humidity (%)	68	58
Visibility (miles)	6,0	12
Maximum Temperature (℃)	20	17
Precipitation	0	0

Visibility is a measure of the distance at which an object or light can be clearly seen.

3.1.1 Determine the visibility distance in kilometres for Pretoria.
(**Use 1,609 km = 1 mile**) (2)

3.1.2 Write down Cape Town's humidity as a simplified common fraction. (2)

3.1.3 Express the sunset time in Cape Town in 12-hour format. (2)

3.1.4 Convert the maximum temperature for Pretoria to degrees Fahrenheit (°F). Give your final answer to the nearest whole number.

You may use the following formula:
°F = (℃ × 1,8) + 32 (3)

3.2 Study the fish tank below and answer the questions that follow.
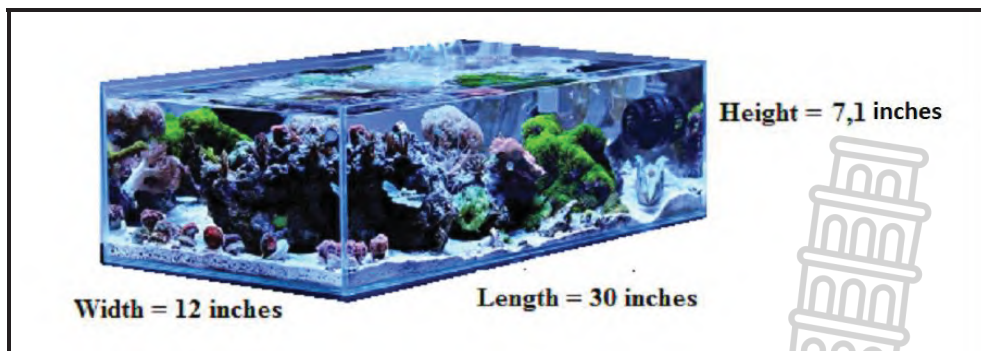
[Source: quora.com]

3.2.1 Calculate the volume of the fish tank above in cubic inches (in^3).

You may use the formula:
Volume = Length × Width × Height (3)

3.2.2 The fish tank is 85% full. After adding stones to the bottom of the fish tank, the fish tank is 97% full. Calculate the volume of the stones. (5)

[17]

QUESTION 4

4.1 Rochester is in the north east of New York state. Study the map below and answer the questions that follow.

[Source: *filmrochester.org*]

4.1.1 Write down the name of the city where Roads 84, 91 and 95 meet. (2)

4.1.2 Using the given scale, determine the actual distance in miles between Buffalo and Albany, if the distance on the map between these two places is 7,5 cm. (3)

4.1.3 Identify the roads that Bande will use to travel from Scranton to Albany. (2)

4.1.4 Write down the compass direction when travelling from Hartford to Boston. (2)

4.1.5 Identify the road that will help you to travel from New York to the far west of the map. (2)

4.1.6 Determine the probability of randomly selecting a road on the map with an even number. (2)

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QUESTION 5

Study the information on eggs in Incubators and Poults/Chickens hatched during the different months in the United States for the 2016–2017 period.

Month	Eggs in incubators on the first of the month	Poults/Chickens hatched during the entire month
	2016–2017	2016–2017
September	28 927	23 645
October	28 409	23 572
November	27 179	22 782
December	28 795	25 422
January	29 961	25 332
February	29 906	23 598
March	30 030	25 719
April	28 597	23 179
May	28 825	24 067
June	29 441	25 075
July	29 271	24 616
August	29 725	24 786
TOTAL	--------	---------

5.1   Determine the number of eggs that did not hatch in December.   (2)

5.2   Calculate the mean number of eggs in incubators for the 2016–2017 period.   (3)

5.3   Write down the modal value for the number of eggs in the incubators on the first of the month.   (2)

5.4   Determine the range of the Poults hatched the entire month during the 2016–2017 period.   (2)

5.5   Calculate the median of the Poults hatched for the entire month during the 2016–2017 period.   (3)

5.6   Express the number of hatched poults during the entire month of March as a ratio to the total hatched during 2016–2017 period.   (3)

5.7   Determine the probability, as a percentage, of randomly selecting the number of eggs in an incubator during July.   (3)

5.8   Name the type of graph that can best display the above information.   (2)

                                                                                                                                     [20]

                                                                                                                    TOTAL: 100

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TO: DISTRICT HEADS OF EXAMINATIONS
**   PRINCIPALS OF SCHOOLS IN THE FET BAND**

FROM: CES: INSTRUMENT DEVELOPMENT AND MODERATION SECTION
**   MS N. MBELEKI**

SUBJECT: ERRATA – MATHEMATICAL LITERACY P1, GRADE 11 NOVEMBER 2018

DATE: 19 NOVEMBER 2018

The **Mathematical Literacy Paper 1** (Grade 11 November 2018) was written on Friday, 16 November 2018. We were made aware of certain errors, amendments and omissions that were discovered during the marking process.

In order to address this and to ensure that learners are not disadvantaged, the following standardised approach to marking must be adopted across the Province. The following guidelines with regard to marking was prepared in conjunction with the examiner and moderator.

QUESTION 3.1.3 Time of sunset in Cape Town = 17:50 12-hour format = 05:50 pm √√ A	2A Correct Answer (2) L1 M
QUESTION 5.2 Mean = 29 088,83 √ CA	(Final Answer)
QUESTION 5.5 Mean = 24 341,5 √ CA	(Final Answer)

We request that this should be brought to the attention of all educators marking these papers and sincerely apologise for the inconvenience.

Yours in education.

_____   19 November 2018
MS N. MBELEKI   **DATE**

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GRADE 11

NOVEMBER 2018

MATHEMATICAL LITERACY P1
MARKING GUIDELINE

MARKS: 100

Symbol	Explanation
M	Method
MA	Method with accuracy
CA	Consistent accuracy
A	Accuracy
C	Conversion
S	Simplification
RT/RG/RM	Reading from a table/Reading from a graph/Reading from map
F	Choosing the correct formula
SF	Substitution in a formula
J	Justification
P	Penalty, e.g. for no units, incorrect rounding off etc.
R	Rounding Off/Reason
AO	Answer only
NPR	No penalty for rounding

This marking guideline consists of 6 pages.

QUESTION 1 [21]			
Ques	**Solutions**	**Explanation**	**T&L**
1.1.1	R2 578 799 Two million, five hundred and seventy eight thousand seven hundred and ninety nine rand ✓✓A	2A Write in words (2)	F L1
1.1.2	% Deposit = $\dfrac{\overset{✓M}{386\,819,85}}{2\,578\,799} \times 100$ ✓M = 15% ✓A	1M Correct values 1M Multiply by 100 1A Answer in % (3)	F L1

1.1.3	R386 819,85 ✓A
	Transaction Cost = R5,75 + R1,10 × $\dfrac{386\,819,85}{100}$✓M
	              = R5,75 + R4 255,02
	              = R4 260,77 ✓CA
		1A Correct value
		
		1M Dividing by 100
		1CA Transaction cost (3)
		NPR
			F
			L1

1.2.1	Distance = 82,3 – 26,9 ✓M✓RT = 55,4 km ✓ CA	1RT Correct distances 1M Subtraction 1CA Distance (3)	M L1
1.2.2	Time taken = 04:54:45 – 03:05:14 ✓M = 01:49:31 ✓CA	1MA Subtracting correct times 1CA Time (2)	M L1
1.2.3	Distance in metres = 68,9 × 1 000 ✓C = 68 900 m ✓A	1C Multiply by 1 000 1A Distance in metres (2)	M L1
1.3.1	12, 8, 7, 5, 2, ✓RG ✓M	1RG Correct values 1M Descending order (2)	D L1
1.3.2	Bar graph **OR** Column graph ✓✓ A	2A Correct graph (2)	D L1
1.3.3	Total number of houses = 12 + 8 + 7 + 5 + 2 ✓RG = 34 ✓A	**CA from 1.3.1** 1RG Values from the graph 1A Number of houses (2)	D L1
			[21]

Please turn over

QUESTION 2 [29]			
Ques	Solution	Explanation	T&L
2.1.1	R2 250 ✓✓ RT	2RT Break-even amount (2)	F L1
2.1.2	Cost of A = R1 500 + R5,00(50) ✓SF = R1 500 + R250 ✓ S = R1 750 ✓CA	1SF Substitution 1S Simplification 1CA Answer (3)	F L1
2.1.3	Income = R15,00 × 250 ✓✓ = R3 750,00	1RT Correct values 1M Multiplication (2)	F L1
2.1.4	Profit = Income – Expenses = R5 250 – R3 250 ✓RT ✓M = R2 000 ✓A	1RT Correct values 1M Subtraction 1M Profit (3)	F L1
2.2.1	1st year = R60 000 × 8,5% ✓M = R5 100 ✓A	1M Multiplication 1CA Interest (2)	F L2
2.2.2	1st year total amount = R5 100 +R60 000 ✓M = R65 100 ✓ CA 2nd year total amount = R65 100 × 8,5 % = R5 533,50 ✓CA Total at the end of 2 years = R65 100 + R5 533,50 ✓M = R70 633,50 ✓CA	**CA from 2.2.1** 1M Adding interest 1CA Amount 1CA % calculation 1M Adding interest 1CA Total amount (5)	F L2
2.3.1	Water used = 587-561 = 26 kℓ ✓M Cost = (0 × 6 kℓ) ✓A + (20 × R10,02) ✓ M = R200,40 ✓CA Total cost = 200,40 + 80,70 = R281,10 ✓CA	1M Water used 1RT Free kℓ 1M Multiplying by R10,02 1CA Water cost 1CA Cost including additional charge (5)	F L2
2.3.2	VAT amount = R80,70 × 15% ✓M = R12,105 ✓S = R12,10 ✓R	1M Multiplying 1S Simplification 1R Rounding (**Accept R 12,11**)(3)	F L1

2.4.1	Inflation rate is a measure of inflation expressed in % showing the increase in price of goods and services. ✓✓A **OR** The rate at which price increases over time if there is a decline in the purchasing value of-money ✓✓A	2A Explanation (2)	F L1
2.4.2	Price of brown bread in 2017 $= (1 + 6{,}59\,\%) \times R9{,}99$ ✓ M $= R10{,}65$ ✓ A	1M Multiply correct values 1A Cost (2)	F L1
			[29]

QUESTION 3 [17]

Ques	Solution	Explanation	T&L
3.1.1	12 miles ✓ RT Distance $= 12 \times 1{,}609$ $= 19{,}308$ km ✓A	1RT Correct value 1A Answer in km **NPR** (2)	M L1
3.1.2	Humidity of Cape Town $= \dfrac{68}{100}$ ✓ RT $= \dfrac{17}{25}$ ✓ A	1RT Correct value 1A Simplified fraction (2)	M L1
3.1.3	Time of sunset in Cape Town = 17:27 12-hour format = 05:27 pm ✓✓ A	2A Correct time (2)	M L1
3.1.4	$^\circ F = (^\circ C \times 1{,}8) + 32$ $= (17 \times 1{,}8) + 32$ ✓ SF $= 62{,}6$ ✓ S $= 63\,^\circ F$ ✓ R	1SF Correct value 1S Simplification 1R Rounding (3)	M L2
3.2.1	Volume = Length $\times$ Width $\times$ Height $= 30$ in $\times$ 12 in $\times$ 7,1 in ✓ SF $= 2\,556$ in^3 ✓S ✓A	1SF Substitution 1S Simplification 1A Correct unit (3)	M L2

Please turn over

3.2.2	Volume of the tank = 2 556 in³ × 85% ✓M
	                            = 2 172,6 in³ ✓CA
	
	Increased volume after stones added = 2556 × 97%
	                                            = 2479,32 in³ ✓CA
	Volume of stones = 2479,32 – 2 172,6 ✓M
	                          = 306,72 in³ ✓CA
	OR
	Volume of stones = 97% - 85% ✓M ✓M
	                          = 12% × 2556 ✓M ✓M
	                          = 306,72 in³ ✓CA
		CA from 3.2.1
		1M Multiply by 85%
		1CA Volume
		
		1CA Volume
		
		1M subtraction
		1CA Volume
		
		1M Using correct values
		1M Subtraction
		2M Multiplication by 12% and 2556
		1CA Volume of stones (5)
			M
			L3

			[17]

QUESTION 4 [13]

Ques	Solutions	Explanation	T&L
4.1	Hartford ✓✓RM	2RM Correct city (2)	M&P L1

4.2	Distance on the map = 7,5 cm
	        2,5 cm = 100 miles ✓M
	        $\frac{7,5}{2,5}$ = 3 cm ✓S
	3 × 100 = 300 miles ✓CA
		1M Scale measure **(use the scale as from actual map)**
		1S Division
		
		1CA Multiply by 100 (3)
			M&P
			L2

4.3	84✓and 87 ✓ RG **OR** 81,✓88 and 90 ✓RG	2RG Combination of roads (2)	M&P L1
4.4	North East ✓✓A	2A Correct direction (2)	M&P L1
4.5	Road 80 ✓✓ RG	2RG Correct road (2)	M&P L1
4.6	Probability = $\frac{\mathbf{8}}{\mathbf{16}}$ ✓ RG ✓ RG	1A Numerator 1A Denominator (2)	P L2
			[13]

QUESTION 5 [20]			
Ques	**Solutions**	**Explanation**	**T&L**
5.1	Poults not hatched in December = 28 795 – 25 422 ✓M = 3 373 ✓CA	1M Subtracting correct values 1CA Not hatched (2)	D L1
5.2	Mean = 28 927 + 28 409 + 27 179 + 28 795 + 29 961 + 29 906 + 30 030 + 28 597 + 28 825 + 29 441 + 29 271 + 29 725 ✓ M = $\dfrac{349\,066}{12}$ ✓M = 29 088,93 ✓CA	1M Adding 1M Dividing by 12 1CA Mean **NPR** (3)	D L2
5.3	No modal value ✓✓A	2A Modal value (2)	D L1
5.4	Range = highest value – lowest value = 25 719 – 22 782 ✓MA = 2 937 ✓CA	1MA Subtracting correct values 1CA Range (2)	D L2
5.5	25 719, 25 422, 25 332, 25 075, 24 786, 24 616, 24 067, 23 645, 23 598, 23 572, 23 179, 22 782 ✓A Median = $\dfrac{24\,616 + 24\,067}{2}$ ✓MA = 24 341 ✓ CA	1M Arranged 1MA Median concept with correct values 1CA Median (3)	D L2
5.6	Total hatched during 2016-2107= 291 7893 ✓M Hatched in March= 25 719 ✓ RT Ratio. 25 719 : 29 1793 ✓ CA	1M Addition 1RT 1CA Express a ratio. (3)	D L2
5.7	$P_{(July\,eggs)} = \dfrac{29\,271}{349\,066} \times 100$ ✓M ✓M = 8,39 % ✓CA	**CA from 5.1.2** 1M Fraction 1M Multiplying by 100 1CA % (3) **NPR**	P L2
5.8	Compound bar graph ✓✓A **OR** Bar graph ✓✓A **OR** Line graph ✓✓A	2A Type of graph (2)	D L1
			[20]
		TOTAL:	**100**