basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL
SENIOR CERTIFICATE

GRADE 12

MATHEMATICAL LITERACY P1

NOVEMBER 2015

MEMORANDUM

MARKS: 150

Codes	Explanation
M	Method
MA	Method with Accuracy
CA	Consistent Accuracy
A	Accuracy
C	Conversion
D	Define
J	Justification/Reason/Explain
S	Simplification
RD	Reading from a table OR a graph OR a diagram OR a map OR a plan
F	Choosing the correct formula
SF	Substitution in a formula
O	Opinion
P	Penalty, e.g. for no units, incorrect rounding off, etc.
R	Rounding Off
NP	No penalty for rounding OR omitting units

This memorandum consists of 17 pages.

KEY TO TOPIC SYMBOL:

F = Finance; M = Measurement; MP = Maps, Plans and other representations
DH = Data Handling; P = Probability

QUESTION 1 [38]

Ques	Solution	Explanation	Level
1.1.1	$67 \times 2 + 16$ ✓MA $= 150$ ✓CA	1MA multiply by 2 and adding 16 1CA simplifying **Answer only full marks** (2)	L1
1.1.2	✓M ✓A Cost = R225,00 × 152 = R34 200 **OR** ✓M Number of persons = R34 200 ÷ R225 = 152 ✓A (150 guests + bridal couple) **OR** ✓M ✓A Cost per person = R34 200 ÷ 152 = R225	1M multiply by R225 1A for 152 **OR** 1M divide by R225 1A number of persons **OR** 1M divide by 152 1A cost per person (2)	L1
1.1.3	✓M % Reception costs $= \dfrac{R66\,450}{R125\,000} \times 100\%$ $= 53,16\%$ ✓CA	1M correct fraction 1CA percentage **Answer only full marks** **NP – rounding** (2)	L1
1.1.4	Flowers and decor = 1,8% × R125 000 ✓M = R2 250 ✓A	1M percentage 1A amount **Answer only full marks** (2)	L1

Ques	Solution	Explanation	Level

1.1.5	Rand value = GHS 30 000 ÷ 0,32253 ✓M
	    ≈ R93 014,60 ✓A
	
	Shortfall = R125 000 – R93 014,60 ✓M
	    = R31 985,40 ✓CA
	
	OR
	
	Cedi value = R125 000 × 0,32253 ✓MA
	    = GHS 40316,25
	
	Shortfall = GHS 40 316,25 – GHS 30 000 ✓M
	    = GHS 10 316,25 ✓A
	
	Rand value = GHS 10 316,25 ÷ 0,32253
	    = R31 985,40 ✓CA
		1M divide
		1A correct rounding
		
		1M subtraction
		1CA amount
		
		OR
		
		1MA multiply
		
		1M subtraction
		1A shortfall amount
		
		1CA amount
		
		� **Answer only full marks**
		NP – rounding
		
		(4)
			L2

1.1.6	$\dfrac{14}{100}$ × R1 349 = R188,86 ✓A ✓M
	Cost including VAT = R1 349 + R188,86
	    = R1 537,86 ✓A
	Selling price in cedi = R1 537,86 × 0,32253 ✓M
	    ≈ 496 ✓CA
	
	OR
	
	VAT inclusive cost = R1 349 × 1,14 ✓A ✓M
	    = R1 537,86 ✓A
	
	Selling price in cedi = 1 537,86 × 0,32253 ✓M
	    ≈ 496 ✓CA
	
	OR
	
	Price in cedi = 1 349 × 0,32253 ✓M
	    = 435,09 ✓A
	
	Selling price including VAT in cedi
	= 435,09329 × 1,14 ✓A ✓M
	≈ 496 ✓CA
		1A multiply by 14%
		
		1M adding amount
		
		1A amount with VAT
		
		1M multiply by 0,32253
		1CA value to nearest cedi
		
		OR
		
		1A working with 14%
		1M multiply by 1,14
		1A amount with VAT
		1M multiply by 0,32253
		1CA value to nearest cedi
		
		OR
		
		1M multiply by 0,32253
		1A cedi price
		
		1A working with 14%
		1M multiply by 1,14
		1CA value to nearest cedi
		
		Answer only full marks
		
		(5)
			L1

Ques	Solution	Explanation	Level
1.1.7	✓A ✓J • Photographer (video) to create memories of the wedding day • Wedding attire – usually special wedding attire are required • Wedding contract to pay for the lawyer's fees for drawing up the contract • Gifts as a token for members who serve • DJ to provide for the music at the reception (accept any valid wedding expense with an explanation) (2)	1A wedding expense 1J explanation	L1 L2
1.2.1	**Employee** works and receives money for the work done ✓D **Employer** is a person or institution that hires workers and pays wages/salary for work done ✓D (2)	1D employee 1D employer	L1
1.2.2	Unemployment Insurance Fund ✓✓D (2)	2D expanding	L1
1.2.3	R15 521✓✓A (2)	2A amount	L1
1.2.4	✓A No No amount allocated ✓E (2)	1A correct statement 1E reason	L1

1.2.5	Monthly tax credit = R2 760 ÷ 12 ✓MA
	                 = R230 ✓CA
		1MA divide correct value by 12
		1CA monthly tax credit
		
		Answer only full marks
		                                                      (2)
			L1

1.2.6	**A** = R13 909 + R20 013 + R8 640 ✓M
	    = R42 562 ✓CA
		1M correct values
		1CA total deductions
		Answer only full marks
		                                                      (2)
			L1

Ques	Solution	Explanation	Level
1.2.7	Gross non-retirement funding income = R15 521 + R26 188 + R8 640 ✓M✓A = R50 349 **OR** Adding the amounts with source codes 3605, 3713 and 3810 **OR** Adding the annual payment other allowances and medical aid contributions (2)	1M using the correct values/codes/words 1A addition	L1

1.2.8	Remaining monthly contributions
	    ✓A
	= R13 909 – R4 975,25
	= R8 933,75 ✓CA
	
	                  ✓M
	Average monthly contribution = R8 933,75 ÷ 7 ✓A
	                           = R1 276,25 ✓CA
	
	 (5)
		1A R13 909
		1CA subtracting R4 975,25
		1M dividing the remaining amount
		1A by 7
		1CA pension per month (only if division by 4,5,6,7)
		
		Answer only full marks
			L2

			[38]

QUESTION 2 [31]

Ques	Solution	Explanation	Level

2.1.1	Total area of a rectangular piece = 30 cm × 12 cm $\checkmark$SF
	                   = 360 cm² $\checkmark$ A
	
	                 $\checkmark$M
	Off-cut piece = 360 cm² − 355,25 cm²
	             = 4,75 cm² $\checkmark$CA
	
	Total off-cut piece for both sides = 4,75 cm² × 2 $\checkmark$M
	                                  = 9,5 cm² $\checkmark$CA
	
	OR
	                  $\checkmark$M $\checkmark$SF
	Total area of 2 rectangular pieces = 2 × 30 cm × 12 cm
	                          = 720 cm² $\checkmark$ A
	
	Area of both sides of stocking = 355,25 cm² × 2 $\checkmark$M
	                           = 710,5 cm²
	                 $\checkmark$M
	Total off-cut piece = 720 cm² − 710,5 cm²
	                 = 9,5 cm² $\checkmark$CA
	
	OR
	
	Total off-cut area
	   $\checkmark$M $\checkmark$SF $\checkmark$M
	= (2 × 30 cm × 12 cm) − (355,25 cm² × 2)
	   $\checkmark$ A $\checkmark$M
	= 720 cm² − 710,5 cm²
	= 9,5 cm² $\checkmark$CA
		1SF substitution
		1A simplifying
		
		1M subtraction
		1CA area of off-cut
		
		1M multiply by 2
		1CA area of off-cut
		
		OR
		
		1SF substitution
		1M multiply by 2
		1A simplifying
		
		1M multiply by 2
		
		1M subtraction
		1CA area of off-cut
		
		OR
		
		1SF substitution
		1M multiply by 2
		1M multiply by 2
		1A simplifying
		1M subtraction
		1CA area of off-cut
		
		Answer only full marks
		
		                                 (6)
			L3

Ques	Solution	Explanation	Level
2.1.2	$\text{Area of a triangle} = \left(\dfrac{1}{2} \times 3\,cm \times 5\,cm\right) \checkmark SF$ $= 7{,}5 \text{ cm}^2 \ \checkmark A$ $\text{Area of 6 triangles} = 7{,}5 \text{ cm}^2 \times 6 \ \checkmark M$ $= 45 \text{ cm}^2 \ \checkmark CA$ **OR** $\text{Area of triangles} = \left(\dfrac{1}{2} \times 3\,cm \times 5\,cm\right)^{\checkmark SF} \times 6 \ \checkmark M$ $\overset{\checkmark A}{= 7{,}5 \text{ cm}^2} \times 6$ $= 45 \text{ cm}^2 \ \checkmark CA$	1 SF substitution 1A simplifying 1M multiply by 6 1CA total area **OR** 1 SF substitution 1M multiply by 6 1A simplifying 1CA total area **Answer only full marks** **NP -units** (4)	L2
2.1.3	$\text{Time taken} = 9 \times 18 \text{ minutes}$ $= 162 \text{ minutes} \ \checkmark MA$ $= 2 \text{ h } 42 \text{ min OR } 2{,}7 \text{ h} \ \checkmark C$ $\text{Finishing time} = 08{:}25 + 2h42 \checkmark M$ $= 11{:}07 \ \checkmark CA$	1MA time in minutes 1C converting time 1M adding 1CA finishing time correct notation **Answer only full marks** **Two marks for 11: *xx*** (4)	L2

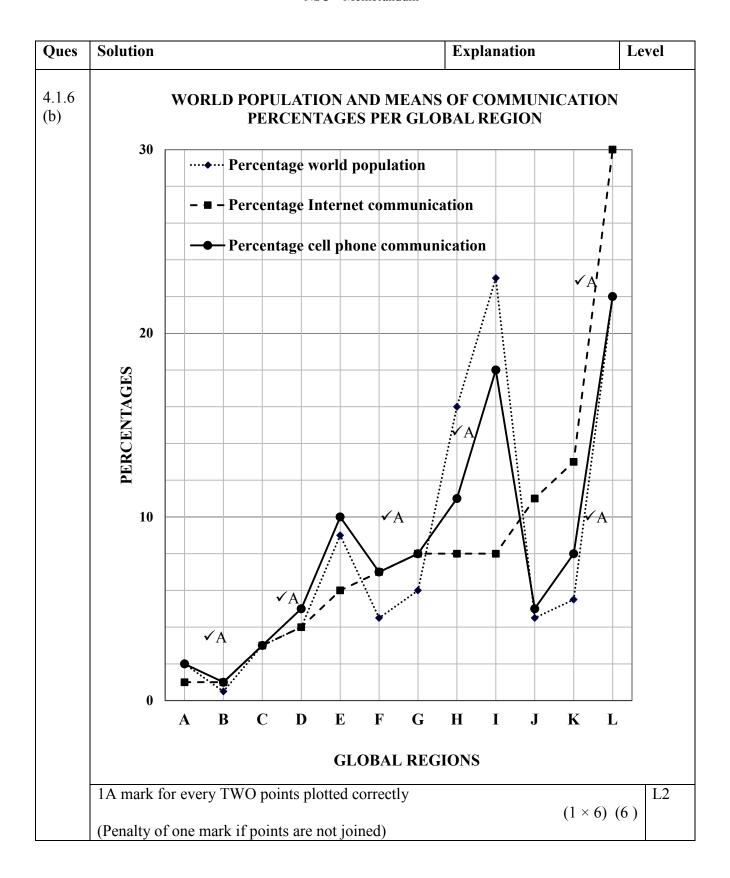| Ques	Solution	Explanation	Level
2.2	$\checkmark$M $\checkmark$A Number of reels along length = 195 mm ÷ 23mm = 8,4782… ≈ 8 $\checkmark$R Number of reels along breadth = 120 mm ÷ 23mm = 5,2173… ≈ 5 $\checkmark$R Total = 5 × 8 = 40 $\checkmark$CA	1M dividing length by diameter 1A diameter 1R number rounded down 1R number rounded down 1CA total number **Full marks for Total = 5 × 8 = 40** **Max of 2 marks if divided by circle's area Max of 3 marks if divided by square area 1 mark for area of rectangle only** (5)	L2
2.3.1	Painted surface area of the lid $\checkmark$A $\checkmark$SF = 3,142 × 3,6 cm (3,6 + 2 × 0,9) cm $\checkmark$C ≈ 61 cm² $\checkmark$CA **OR** Painted surface area of the lid $\checkmark$A $\checkmark$SF = 3,142 × 36 mm (36 + 2 × 9) mm = 6108,05 mm² $\checkmark$CA ≈ 61 cm² $\checkmark$C	1A radius 1SF substitution 1C conversion 1CA surface area to nearest cm² **OR** 1A radius 1SF substitution 1CA surface area to nearest cm² 1C conversion **Max of 3 marks if inner radius used Max of 2 marks if units are mixed** (4)	L2

Ques	Solution	Explanation	Level

2.3.2	Capacity = 75% $\times$ 250 mℓ ✓M
	       = 187,5 mℓ ✓CA
	
	Volume = 187,5 cm³
	
	Height of the water in the jar
	$= \dfrac{\text{Volume of the water (in cm}^3)}{\pi \times \text{radius}^2}$
	
	$= \dfrac{187,5\,\text{cm}^3}{3,142 \times (3,25\,\text{cm})^2}$ ✓✓SF
	
	$= \dfrac{187,5\,\text{cm}^3}{33,187375\,\text{cm}^2}$
	$= 5,6497\ldots$ cm ✓CA
	≈ 6 cm ✓R
	
	OR
	
	$= \dfrac{\text{Volume of the water (in cm}^3)}{\pi \times \text{radius}^2}$
	
	$= \dfrac{250\,\text{cm}^3}{3,142 \times (3,25\,\text{cm})^2}$ ✓✓SF
	
	$= \dfrac{250\,\text{cm}^3}{33,187375\,\text{cm}^2}$
	$= 7,532\ldots$ cm ✓CA
	
	Height of the water in the jar
	$= 75\% \times 7,532\ldots$cm ✓M
	$= 5,6497\ldots$ cm ✓CA
	≈ 6 cm ✓R
		1M multiply by 75%
		1CA capacity in mℓ
		
		2SF substitution
		
		1CA simplification
		1R nearest cm
		
		OR
		
		2SF substitution
		
		1CA simplification
		
		1M multiply by 75%
		1CA height of water
		1R nearest cm
		
		┌──────────────────────┐
		│ **Answer only full marks** │
		└──────────────────────┘
		                     (6)
			L2

2.3.3	✓M $2 \times \dfrac{1}{16} = \dfrac{2}{16} = \dfrac{1}{8}$ ✓A	1M multiply by 2 1A fraction Accept $\dfrac{2}{16}$ ┌──────────────────────┐ │ **Answer only full marks** │ └──────────────────────┘ (2)	L1
			[31]

QUESTION 3 [24]			
Ques	Solution	Explanation	Level
3.1.1	Exit 3 ✓✓RD	2RD reading from plan (2)	L1
3.1.2	✓A ✓J No, there is no power outlet available in that seat	1A answer 1J reason (2)	L1
3.1.3	✓RD C 109 ✓RD	1RD correct row 1RD correct seat number (2)	L2

3.1.4	Total seats
	 = seats one side + seats in middle + seats other side
	 = (3+2×6+ 3×7 + 6×8 +5)+(8 +13 + 11×14 + 6) +
	   (3 + 5 + 6 + 3×7 + 5×8)
	    ✓MA ✓MA ✓MA
	 = 89 + 181 + 75
	 = 345 ✓CA
		3MA adding correct number of seats in each section
		 1CA total seats
		
		 ⬚ Answer only full marks ⬚
		
		 ⬚ Max 2 marks if answer only 344 or 346 ⬚ (4)
			L1

3.1.5	104 and 110✓✓RD	2RD seat numbers (2)	L1
3.1.6	✓A Number of seats with access to a power supply = 52 Probability = $\dfrac{52}{345}$ ✓CA ✓CA	1A counting seat 1CA numerator 1CA writing as a denominator from 3.1.4 ⬚ $\dfrac{27}{345}$ OR $\dfrac{9}{115}$ OR $\dfrac{54}{345}$ OR $\dfrac{18}{115}$ Max 2 ⬚ ⬚ Answer only full marks ⬚ (3)	L2
3.2.1	14 times ✓✓RD [Free State 15 times]	2RD reading from map If 13 one mark (2)	L1

Ques	Solution	Explanation	Level
3.2.2	Distance = 94,7 km – 76 km ✓MA = 18,7 km ✓A	1MA subtracting from 94,7 1A distance **Answer only full marks** (2)	L1
3.2.3	Blue Hills ✓✓RD	2RD reading from map (2)	L1
3.2.4	✓RD ✓RD WP 4, WP 5, WP 6 ✓RD **OR** WP3 to WP4 , WP 4 to WP5 , WP5 to WP6 ✓✓✓RD	3RD reading from map **OR** 3RD reading from map **2 marks for W4 to W6** (3)	L1
			[24]

QUESTION 4 [30]			
Ques	**Solution**	**Explanation**	**Level**
4.1.1	✓✓J The data for the global regions is qualitative. **OR** The global regions cannot be expressed as numerical data ✓✓J	2J explanation **OR** 2J explanation (2)	L1
4.1.2	5% ✓✓RT and 8% ✓RT	3RT Correct modal % **Two marks for first correct answer, one mark for second correct answer** (3)	L1
4.1.3	Median = $\dfrac{7+8}{2}$% ✓✓M = 7,5% ✓CA	2M for adding correct values and dividing by 2 1CA answer **Answer only full marks** (3)	L2
4.1.4	✓RT Total usage = 3% + 8% + 11% = 22% ✓CA	1RT correct values 1CA total **Answer only full marks** (2)	L1
4.1.5	✓✓M 2% + 9% + 23% + 22% = 56% ✓CA Note: Candidates that add the 4% of the Middle East is also correct.	2M Adding all correct values. 1CA total **Answer only full marks** **Answer only 60% full marks** (3)	L1
4.1.6 (a)	16% ✓✓RG	2RG correct value (2)	L1

Ques	Solution	Explanation	Level
4.1.6 (b)			
	1A mark for every TWO points plotted correctly (Penalty of one mark if points are not joined)	(1×6) (6)	L2

WORLD POPULATION AND MEANS OF COMMUNICATION PERCENTAGES PER GLOBAL REGION

Ques	Solution	Explanation	Level
4.1.7	South Asia **OR** I ✓✓RD	2RD reading from graph or table (2)	L1

4.2.1	Rural Number = 7 095 476 818 × 48%✓A ✓MA
	
	      = 3 405 828 873 ✓A
	
	OR
	       ✓MA
	Urban number = 7 095 476 818 × 52%
	      = 3 689 647 945 ✓A
	
	Rural = 7 095 476 818 – 3 689 647 945
	      = 3 405 828 873 ✓A
		1MA multiplying with %
		1A 48 %
		1A persons
		
		OR
		
		1MA multiplying with %
		1A urban number
		
		1A persons
		
		⎡ **Answer only full marks** ⎤ (3)
			L1

4.2.2	Social networking users $= \dfrac{1\ 856\ 680\ 860}{7\ 095\ 476\ 818} \times 100\%$ ✓SF $= 26{,}167\ldots\%$ ✓CA	1SF dividing the correct value by 7 095 476 818 1CA answer in % ⎡ **Answer only full marks** ⎤ ⎡ **NP - rounding** ⎤ (2)	L1
4.2.3	6 572 950 124 ✓✓A	2A for correct digits (2)	L1
			[30]

QUESTION 5[27]			
Ques	**Solution**	**Explanation**	**Level**
5.1.1	✓MA M = 2 925 + 1 970 + 1 963 + 1 568 + 1 700 + 1 817 + 1 342 + 2 118 = 15 403 ✓CA	1MA adding all values 1CA value of M ┌─────────────────┐ │ **Answer only full marks** │ └─────────────────┘ ┌─────────────────┐ │ **Full marks for 15 404** │ └─────────────────┘ ┌─────────────────┐ │ **Penalty of one if given as 1 000's** │ └─────────────────┘ (2)	**F** L1
5.1.2	Value for both N ✓M = 12 898 – (2 394 + 1 302 + 1 405 + 1 490 + 1 311 + R1 756) = 3 240 ✓CA Each received = $\dfrac{R\,3\,240^{✓M}}{2}$ = R1 620 ✓CA **OR** Sibiya:✓A ✓M ✓M N = R1 970 – R349 – R1 = R1 620 ✓CA **OR** Magome:✓A ✓M ✓M N = R1 963 – R342 – R1 = R1 620 ✓CA	1M subtracting from total 1CA cost for both 1M dividing by 2 1CA amount **OR** 1A for R1 970 1M for subtracting R349 1M for subtracting R1 1CA total Sibiya **OR** 1A for R1 963 1M for subtracting R342 1M for subtracting R1 1CA total Magome ┌─────────────────┐ │ **Answer only full marks** │ └─────────────────┘ ┌─────────────────┐ │ **Penalty of one if given as 1 000's** │ └─────────────────┘ (4)	**F** L2
5.1.3	✓M ✓CA Range = R2 925 000 – R 1 342 000 = R1 583 000	1M concept of range 1CA range ┌─────────────────┐ │ **Answer only full marks** │ └─────────────────┘ ┌─────────────────┐ │ **Penalty of one if not given as 1 000's** │ └─────────────────┘ (2)	**D** L2
5.1.4	Songelwa : Magome = 30 : 342 = 5 :57 ✓A = 1 : 11,4 ✓CA	1A correct values 1CA form ┌─────────────────┐ │ **NP - rounding** │ └─────────────────┘ (2)	**F** L1

Ques	Solution	Explanation	Level

5.1.5	Sibiya:
	Increase = R1 970 000 – R1 872 000 ✓M
	       = R98 000
	
	Phillips:
	Increase = R1 700 000 – R1 625 000
	       = R75 000 ✓M
	
	Mabilane:
	Increase = R2 118 000 – R2 032 000
	       = R86 000 ✓M
	
	Magome:
	Increase = R1 963 000 – R1 861 000
	       = R102 000 ✓A
	Magome received the greatest increase ✓✓CA
		2M subtracting **any two** of Sibiya, Phillips, Mabilane
		
		1A amount for Magome
		2CA correct person
		
		Full marks if only Magome was calculated correctly with conclusion
		
		(5)
			F
			L2

5.1.6	Mabunda MD ✓✓A	2A the correct person **Penalty one mark if an extra name is added** (2)	**D** L1
5.2.1	100% ✓✓A	2A correct % Accept 100 (2)	**P** L1
5.2.2	$P = \dfrac{14}{18}$ ✓A ✓A $= \dfrac{7}{9}$ ✓CA **OR** $P = 1 - \dfrac{4}{18} = \dfrac{7}{9}$ ✓M ✓A ✓CA	1A numerator 1A denominator 1CA simplification **OR** 1M subtracting from 1 1A denominator 1CA simplification **Answer only full marks** (3)	**P** L2

Ques	Solution	Explanation	Level
5.3	Growth 1 st year = 4 705 306 × 5% $\checkmark$A $\approx$ 235 265 $\checkmark$M Total after the 1st year = 4 705 306 + 235 265 = 4 940 571 $\checkmark$CA Growth 2nd year = 4 940 571 × 5,9% = 291 493 OR 291 494 $\checkmark$CA Total after 2nd year = 4 940 571 + 291 493 = 5 232 064 OR 5 232 065 $\checkmark$CA **OR** 100% + 5% = 105% $\checkmark$A Total after 1st year = 4 705 306 × 105% $\checkmark$M = 4 940 571,3 $\checkmark$CA 100% + 5,9% = 105,9% Total after 2nd year = 4 940 571,3 × 105,9% $\checkmark$CA = 5 232 065,007 $\approx$ 5 232 065 $\checkmark$CA **OR** Total after 2nd year $\checkmark$M $\checkmark$A $\checkmark$M $\checkmark$A = 4 705 306 × 105% × 105,9% = 5 232 065,007 $\approx$ 5 232 065 $\checkmark$CA	1A calculating 5% 1M adding 1CA first year total 1CA calculating 5,9% of total 1CA 2nd year total **OR** 1A increasing with 5% 1M percentage calculation 1CA first year total 1CA increasing with 5,9% 1CA 2nd year total, rounded **OR** 1M percentage calculation 1A increasing by 105% 1M percentage calculation 1A increasing by 105,9% 1CA 2nd year total, rounded Answer only full marks (5)	**D** L3
			[27]

TOTAL: **150**