basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL
SENIOR CERTIFICATE

GRADE 12

MATHEMATICAL LITERACY P1

FEBRUARY/MARCH 2014

MEMORANDUM

MARKS: 150

Symbol	Explanation
M	Method
M/A	Method with accuracy
CA	Consistent accuracy
A	Accuracy
C	Conversion
S	Simplification
RT/RG	Reading from a table/Reading from a graph
SF	Correct substitution in a formula
O	Opinion/Example
P	Penalty, e.g. for no units, incorrect rounding off etc.
R	Rounding off

This memorandum consists of 12 pages.

QUESTION 1 [27 MARKS]

Ques	Solution	Explanation	AS/L
1.1.1	$45 \% \text{ of } 26{,}7 - \sqrt{\dfrac{24 \times 345}{10\,389}}$ $= 12{,}015 - 0{,}8927467...$ ✓A $= 11{,}12225....$ $\approx 11{,}12$ ✓CA	1A calculation 1CA rounding (2)	12.1.1 L1
1.1.2	$1{,}068 = \dfrac{1\,068}{1\,000} \overset{✓A}{=} \dfrac{267}{250} = 1\dfrac{17}{250} \overset{✓A}{}$	1A fraction 1A simplest form (2)	12.1.1 L1
1.1.3	✓A September 1970 ✓A	1A Year 1A month (2)	12.1.1 L2
1.1.4	$R1 = €0{,}10717$ $€32\,527 = \dfrac{\mathbf{R1 \times €32\,527}}{\mathbf{€0{,}10\,717}}$ ✓M/A $= R303\,508{,}4445$ $= R303\,508{,}44$ ✓CA	1M/A dividing 1CA simplification (2)	12.1.1 L2
1.1.5	$S(\text{in metre}) = 5(1{,}5)[\,1{,}5 - 1\,]$ ✓SF $= 3{,}75$ ✓CA	1SF substitution 1CA distance (2)	12.2.1 L1
1.1.6	$P(\text{boy}) = \dfrac{18}{42} \overset{✓A}{\underset{✓A}{}}$ $= \dfrac{3}{7}$ ✓CA	1A number of favourable outcomes 1A number of possible Outcomes 1CA simplification (3)	12.4.5 L2
1.1.7	$20 : 12$ $= 5 : 3$ $\therefore 2$ more trains per hour ✓CA **OR** Number of trains in peak periods $= \dfrac{60}{12}$ $= 5$ ✓A Number of trains more $= 5 - 3$ $= 2$ ✓CA	1A writing ratio 1CA more trains **OR** 1A number of trains in peak periods 1CA more trains (2)	12.1.1 L2

Ques	Solution	Explanation	AS/L
1.2.1	$1\,000\text{ g} = 2{,}2\text{ pound}$ $\therefore\ 200\text{ g} = \dfrac{2{,}2}{5}\text{ pounds } \checkmark\text{A}$ $= 0{,}44\text{ pounds} \checkmark\text{S}$	1A divide by 5 1S simplification (2)	12.3.2 L2
1.2.2	$10\text{ tbsp} = 125\text{ m}\ell$ OR $10 : 125 = 3 : x$ $1\text{ tbsp} = 12{,}5\text{ m}\ell\checkmark\text{A}$ $x = \dfrac{125 \times 3}{10}\ \checkmark\text{A}$ $= 37{,}5\text{ m}\ell\checkmark\text{S}$ $\therefore\ 3\text{ tbsp} = 12{,}5 \times 3\text{ m}\ell$ $= 37{,}5\text{ m}\ell\ \checkmark\text{S}$	1A times three 1S simplification (2)	12.3.2 L1
1.2.3	For 6 persons use 50 g $6 = 50\text{ g}\ \checkmark\text{M/A}$ $\therefore\ 1\text{ person use } \dfrac{50}{6} = 8{,}33\text{ g}^{\checkmark\text{M/A}}$ OR $9 = \dfrac{50\text{ g} \times 9}{6}$ $\therefore\ 9\text{ persons use } 8{,}33 \times 9$ $= 75\text{ g }\checkmark\text{CA}$ $= 75\text{ g }\checkmark\text{CA}$	1M/A using ratio 1CA amount of pine nuts (2)	12.1.1 L2
1.3.1	the breadth decreases $\checkmark\checkmark\text{A}$	2A correct answer (1)	12.2.2 L1
1.3.2	$4\text{ m}\ \checkmark\checkmark\text{A}$	2A breadth (1)	12.2.2 L1
1.3.3	$6\text{ m}\ \checkmark\ \checkmark\text{A}$	2A side length (2)	12.3.2 L1
1.3.4	$\text{Number of cabbages} = \dfrac{\overset{\checkmark\text{A}}{400\text{ cm}}}{16\text{ cm}} + 1\text{ at beginning}$ $= 25 + 1$ $= 26\ \checkmark\text{CA}$	1A dividing and adding 1CA number (2)	12.3.1 L2
		[27]	

QUESTION 2 [29 MARKS]

Ques	Solution	Explanation	AS/L
2.1.1	54% ✓✓ RG	2RG percentage (2)	12.4.4 L1
2.1.2	Natural area lost = 70% – 34% ✓ RG = 36% ✓ CA	1RG subtracting correct values 1CA area lost (2)	12.4.4 L1
2.1.3	Ave annual percentage rate = $\frac{127\ 909}{9\ 474\ 740} \times 100\%$ ✓M = 1,35 % per year ✓CA	1M calculating percentage 1CA percentage/annum (2)	12.1.1 L1
2.2.1	Median = $\frac{158+160}{2}$ ✓M = 159 ✓CA	1M finding median 1CA median (2)	12.4.3 L2
2.2.2	6 athletes ✓✓A	2A answer (2)	12.4.3 L2
2.2.3	P(less than 158) = $\frac{5}{12}$ ✓A ✓A ≈ 41,67 % ✓CA	1A number less than 160 1A total number of athletes 1CA % (3)	12.4.5 L2
2.3.1	MHR_{female} = 216 – (1,09 × 18) ✓SF = 196,38 ✓CA	1SF substitution 1CA maximum heart rate (2)	12.2.1 L1
2.3.2	Age = $\frac{202-189,9}{0,55}$ ✓SF = 22 ✓CA	1SF substitution 1CA age (2)	12.2.1 L1
2.3.3 (a)	female ✓A	1A answer (1)	12.2.2 L1
2.3.3 (b)	186 beats per minute ✓✓A	2A correct conclusion (2)	12.2.2 L1
2.3.3 (c)	Female ✓✓A	2A correct gender (2)	12.2.2 L1

Ques	Solution	Explanation	AS/L
2.3.3 (d)	26 ✓✓A	2A correct conclusion (2)	12.2.2 L2
2.3.3 (e)	20 ✓✓A	2A correct conclusion (2)	12.2.2 L2
2.3.3 (f)	Difference in age = 22 – 18 ✓RG ✓RG = 4 years ✓CA	2RG correct values 1CA correct conclusion (3)	12.2.2 L2
		[29]	

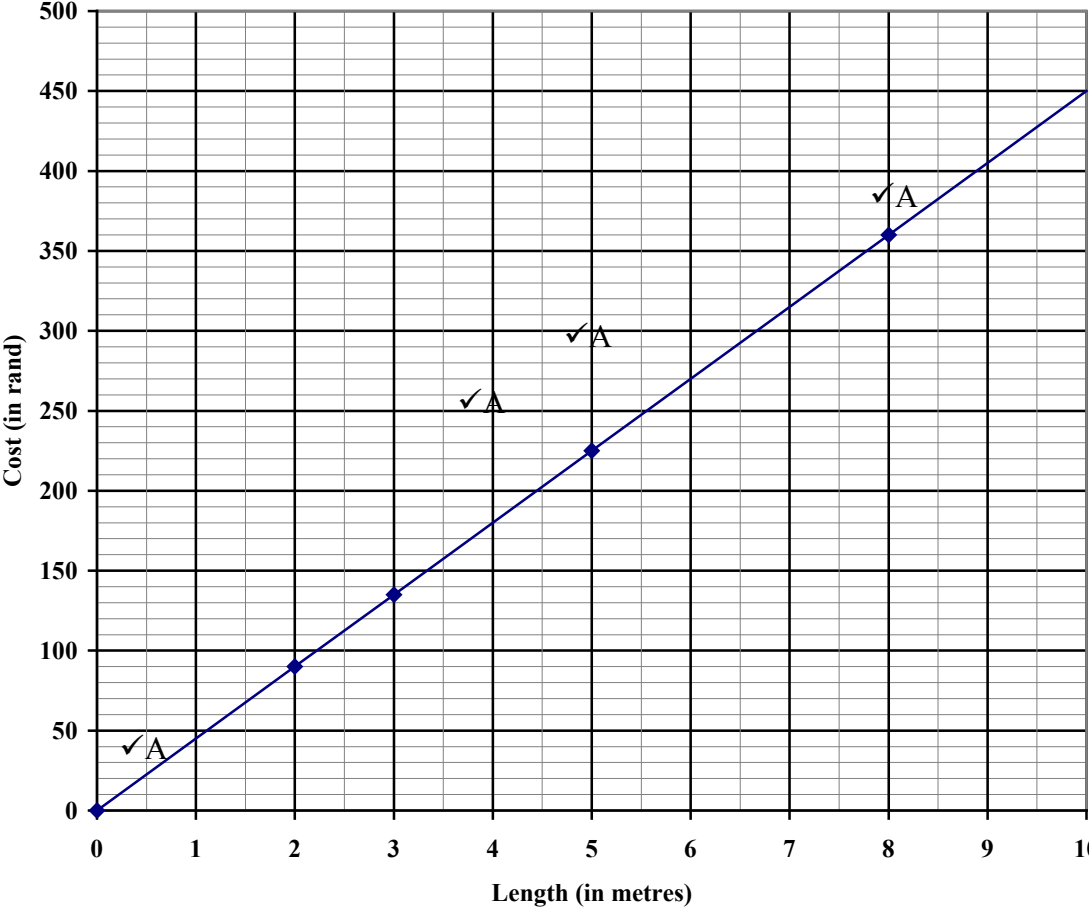| QUESTION 3 [22 MARKS]			
Ques	Solution	Explanation	AS/L
3.1.1	$\checkmark$M A = R6,31 × 9 × 5 $\checkmark$A = R283,95 $\checkmark$CA	1M concept - multiplying 1A correct values 1CA simplification (3)	12.1.1 L1(2) L2(1)
3.1.2	Monthly rate = $\dfrac{\text{Weekly rate} \times 13}{3}$ $= \dfrac{\text{R303,30} \times 13}{3}$ $\checkmark$SF $= $ R1 314,30 $\checkmark$CA	1SF substituting weekly rate 1CA simplification (2)	12.2.1 L1
3.1.3	Percentage increase = $\dfrac{\overset{\checkmark SF}{\text{R316,80}} - \overset{\checkmark SF}{\text{R303,30}}}{\text{R303,30}} \times 100\%$ $\approx$ 4,45 % $\checkmark$CA	1SF new rate 1SF old rate 1CA percentage (3)	12.1.1 L1
3.2.1	Brazil $\checkmark$ RT	1RT correct country (1)	12.4.4. L1
3.2.2	$\overset{\checkmark M}{}$ Total = 10 017 + 5 526 + 0 + 91 916 + 84 + 9 631 tonnes = 117 174 tonnes $\checkmark$ CA	1M addition 1CA correct total (2)	12.1.1 L1
3.2.3	Amount of peaches = $\dfrac{\overset{\checkmark RT}{30,53}}{100} \times$ 1 200 000 tonnes $\checkmark$ M = 366 360 tonnes $\checkmark$ CA	1RT correct percentage 1M writing 1,2 million in full 1CA amount of peaches produced (3)	12.1.1 L1
3.3.1	Gauteng's production area = $\dfrac{2,5}{100}$ $\checkmark$ A $= \dfrac{1}{40}$ $\checkmark$ CA	1A writing in fraction form 1CA simplification (2)	12.1.1 12.4.4 L1
3.3.2	Percentage (Piketberg) = 60% – (12+20+11)% $\checkmark$M = 17% $\checkmark$A	1M subtracting from 60% 1A correct percentage (2)	12.1.1 L1
3.3.3	$\overset{\checkmark A}{}$ Klein Karoo and Free State 11% Wolsley/Tulbagh and Limpopo 12 % $\underset{\checkmark A}{}$	1A Klein Karoo 1A Wolsley/Tulbagh (2)	12.4.4 L1
3.3.4	Ceres $\checkmark\checkmark$A	2A correct area (2)	12.4.4 L1
		[22]	

QUESTION 4 [23 MARKS]

Ques	Solution	Explanation	AS/L
4.1.1	$A = 768 + 1\,080 + 4\,455 + 2\,268$ ✓M $= 8\,571$ ✓CA	1M adding 1CA correct value of A (2)	12.1.1 L1

4.1.2	$B \times 3 \times 5 \times 9 = 4\,455$ ✓M
	    $B \times 135 = 4\,455$
	       $B = 33$ ✓CA
		1M multiplying and equating to 4 455
		
		1CA correct value of B
		 (2)
			12.1.1
			L1

4.1.3	✓A
	$36 \times 3 \times 2 \times C = 1\,080$
	$216 \times C = 1\,080$
	   $C = \dfrac{1080}{216}$ ✓M
	   $C = 5$ ✓CA
		1A correct number of grades
		
		1M dividing
		1CA value of C
		 (3)
			12.1.1
			L2

4.2.1	The Book ✓RT	1RT correct price (1)	12.1.1 L1
4.2.2	R1,80 ✓RT	1RT median (1)	12.4.3 L1
4.2.3	1,52; 1,52; 1,50; 1,48; 1,47; 1,32; 1,32; 1,25; 1,10 ✓✓A	2A correct order (2)	12.4.4 L1
4.2.4	✓A ✓A R1,32 and R1,52	1A R1,32 1A R1,52 (2)	12.4.3 L1
4.2.5	Range = R8,99 – R7,68 ✓M/A = R1,31 ✓CA	1M/A subtracting extreme values 1CA correct range (2)	12.4.3 L1(1) L2(1)

4.2.6	✓M
	Mean = $\dfrac{1,70+1,73+1,75+1,75+1,80+1,92+1,99+2,05+2,15}{9}$
	    = $\dfrac{16,84}{9}$ ✓A
	    = 1,871111…
	    ≈ R1,87 ✓CA
		1M finding mean
		
		1A simplification
		
		1CA mean
		 (3)
			12.4.3
			L2

4.3.1	768 exercise books ≈ 800 exercise books
	
	        ✓R
	Number of packs = $\dfrac{800}{200}$ **OR** Number of packs = $\dfrac{768}{200}$✓A
	       = 4 ✓CA = 3,84
	               ≈ 4 ✓R
		1R rounding to nearest 200
		1CA number of packs
		
		OR
		1A dividing
		1R number of packs
		 (2)
			12.2.1
			L2

Ques	Solution	Explanation	AS/L
4.3.2	Price per pack $= \dfrac{R16\,200 \times 20 \quad \checkmark A}{4\,455} \quad \checkmark SF$ $= R72,73 \quad \checkmark CA$	1A number per pack 1SF substitution 1CA price per pack (3)	12.2.1 L2
		[23]	

QUESTION 5 [26 MARKS]

Ques	Solution	Explanation	AS/L
5.1.1	C 3 ✓✓A OR 3C	1A C 1A 3 (2)	12.3.4 L1
5.1.2	Distance = 8 mm ✓✓A	2A correct measurement (2)	12.3.1 L1
5.1.3	North East ✓A	2A correct direction (1)	12.3.4 L2
5.1.4	✓A ✓A R75 and R329	2A 1 mark for each road (2)	12.3.4 L1
5.2.1	Jackal ✓A	1A correct predator (1)	12.4.3 L1
5.2.2	**LOSS OF LIVESTOCK BY PREDATORS** 	4A any 4 bars plotted correctly 1A all bars plotted correctly 1M correct type of graph (6)	12.4.2 L2

Ques	Solution	Explanation	AS/L
5.3.1 (a)	Total length = 6 $\checkmark$A × 1,5 m + 8 $\checkmark$A × 1 m + 5 $\checkmark$A × 2 m = 9 m + 8 m + 10 m = 27 m $\checkmark$CA	1A using 1,5 m pieces 1A using 1 m pieces 1A using 2 m pieces 1CA length (4)	12.3.1 L2
5.3.1 (b)	Total area of mesh wire = **3 × B × H + 2 × L(H + B)** $\checkmark$SF = 3 × 1 m × 1,5 m + 2 × 2 m(1,5 m + 1 m) = 4,5 m^2 + 10 m^2 $\checkmark$S = 14,5 m^2 $\checkmark$CA	1SF substitute in formula 1S simplify 1CA surface area (3)	12.3.1 L1
5.3.2	Total cost = R59,95 per m² × 699,3 m² $\checkmark$M/A = R41 923,035 $\checkmark$CA ≈ R41 920 $\checkmark$R	1M/A multiplying correct amounts 1CA solution 1R rounding (3)	12.1.1 L2
5.3.3	Original 2 m becomes 3 m ∴ 1 m becomes $\frac{3}{2}$ m $\checkmark$A OR 2 : 1 : 1,5 = 3 : 1,5 : 2,25 $\checkmark$A $\checkmark$A ∴ the height = 2,25 m $\checkmark$CA	1A using ratio 1CA height (2)	12.1.1 L1
		[26]	

QUESTION 6 [23 MARKS]

Ques	Solution	Explanation	AS/L

6.1.1	Area = length × breadth
	    = 30 cm × 45 cm
	    = 1 350 cm^2 ✓A ✓A
		1A solution
		1A correct unit
		 (2)
			12.3.1
			L1

6.1.2	Perimeter = 2(length + breadth) ✓SF
	    = 2(30 cm + 45 cm) ✓S
	    = 2(75 cm)
	    = 150 cm ✓CA
		1SF correct substitution
		1S simplification
		1CA simplifying
		 (3)
			12.3.1
			L1

6.2.1	75 cm ✓✓A	2A correct length (2)	12.3.1 L1
6.2.2	180 cm = 2 × 75 cm + 30 cm ✓M ✓A ✓A ∴ She can make 8 tea towels and 12 dish cloths	1M breaking down 180 cm 1A number of tea towels 1A number of dish cloths (3)	12.3.1 L2

6.2.3	Area (in cm^2) = 900 – (3)^2 (4 - 3,14) ✓SF
	          = 900 – 7,74 ✓S
	          = 892,26 ✓CA
		1SF substitution
		1S simplification
		1CA simplifying
		 (3)
			12.3.1
			L1

6.3.1	✓✓A Cost of the material = R45,00 × length of material (in metres)	2A formula (2)	12.1.1 L1

6.3.2	A = 5 × R45 ✓M
	   = R225 ✓CA
	
	B = $\dfrac{360}{45}$ ✓M
	   = 8 ✓CA
		1M multiplying by 45
		1CA value of A
		
		1M dividing by 45
		1CA value of B
		 (4)
			12.2.2
			L1(2)
			L2(2)

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Ques	Solution	Explanation	AS/L
6.3.3	**COST OF THE MATERIAL** 1A (0;0) 1A (8;360) 1A any other point plotted correctly 1A joining the points with a straight line (CA for values of A and B only) (4)		12.2.2 L2
		[23]	
		TOTAL	**150**