basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

MATHEMATICAL LITERACY P1

NOVEMBER 2012

FINAL 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

PLEASE NOTE:

1. If a candidate deletes a solution to a question without providing another solution, then the deleted solution must be marked.
2. If a candidate provides more than one solution to a question, then only the first solution must be marked and a line drawn through any other solutions to the question.

This memorandum consists of 15 pages.

EXTERNAL MODERATOR	EXTERNAL MODERATOR	INTERNAL MODERATOR
MR MA HENDRICKS	**MR RI SINGH**	**MRS J SCHEIBER**
15 NOVEMBER 2012	15 NOVEMBER 2012	15 NOVEMBER 2012

Rounding off penalty once only in question 5			
QUESTION 1 [34 MARKS]		**Correct answer only: Full marks**	
Ques	**Solution**	**Explanation**	**AS/L**
1.1.1	$1\,441{,}62 - \sqrt{8{,}7^2 - 13{,}26}$ $= 1441{,}62 - \sqrt{62{,}43}$ ✓S $= 1441{,}62 - 7{,}9012...$ $= 1\,433{,}718734$ $\approx 1\,433{,}72$ ✓CA	1S simplifying 1CA simplification (2)	12.1.1 L1
1.1.2	$0{,}0528 = \frac{528}{10\,000}$ ✓A $= \frac{33}{625}$ ✓CA	1A writing as a common fraction 1CA simplifying (2)	12.1.1 L1
1.1.3	$23{,}005\,\ell = 23{,}005 \times 1\,000\,\text{m}\ell$ ✓M/A $= 23\,005\,\text{m}\ell$ ✓CA	1M/A multiplying by 1 000 1CA simplification if multiplied by power of 10 (2)	12.3.2 L2
1.1.4	R63,99/kg × 2,5 kg ✓M/A = R159,975 ≈R159,98 ✓CA (accept R159,97 - no rounding penalty)	1M/A multiplication 1CA simplification to nearest cent (2)	12.1.1 L1
1.1.5	13h15 min – 1h18 min ✓M/A = 11h57 min Shameeg arrived at 11:57. ✓CA **OR** 3 minutes to 12	1M/A subtracting 1h18 min 1CA arrival time (2) (Accept 11H57)	12.3.2 L2
1.1.6	$€\frac{3850}{10{,}2584}$ ✓M/A = €375,30 ✓CA	1M/A dividing 1CA simplification (2)	12.1.3 L2
1.1.7	CERTAIN ✓✓A	2A conclusion (2)	12.4.5 L2
1.1.8	R10,29 ✓✓A	2A median (2)	12.4.3 L1

Ques	Solution	Explanation	AS/L
1.2	21 + 30 + 9 ✓✓A = 60 ✓CA	1A one correct reading from graph 1A correct reading of the other two values from graph 1CA total of the three (values within the range) (3)	12.4.4 L1 (1) L2 (1)
1.3.1	3 × R14,95 ✓M/A = R44,85 ✓CA **OR** R167,45 – 24,95 – 97,65 ✓M/A = R44,85 ✓CA	1M/A multiplying 1CA simplification (CA only when using R14,95 or multiplying 3 with a price on the slip) **OR** 1M/A subtracting the values from the total 1CA the amount (2)	12.1.3 L1
1.3.2	$\frac{97,65}{13,95}$ ✓M/A = 7 bangles ✓CA	1M/A dividing 1CA simplification (2)	12.1.3 L1
1.3.3	R24,95 – R21,89 **OR** 14% of R21,89 ✓M/A = R3,06 ✓CA **OR** ✓M/A R24,95 × $\frac{14}{114}$ = R3,06 ✓CA	1M/A subtracting/ calculating percentage 1CA simplification to the nearest cent **OR** 1 M/A multiplying 1 CA simplification to the nearest cent (2)	12.1.3 L1

Ques	Solution	Explanation	AS/L
1.3.4	$\frac{R167,45}{114\%}$ ✓M ✓A = R 146,89 ✓CA **OR** $\frac{100}{114} \times$ R167,45 ✓M ✓A = R146,89 ✓CA **OR** ✓M VAT = R167,45 × $\frac{14}{114}$ = R20,56 ✓A Total without VAT = R167,45 – R20,56 = R146,89 ✓CA	1M dividing 1A correct values 1CA simplification **OR** 1M dividing 1A correct values 1CA simplification **OR** 1 M calculating VAT 1A correct values 1CA simplification **(if 14% is calculated : 0 marks)** (3)	12.1.3 L2
1.4.1	✓M/A (1,948 + 4,874 + 3,755 + 4,793 + 2,264) millions of tons = 17,634 millions of tons ✓CA **OR** 17 634 000 tons	1 M/A adding 1CA total (if using the wrong data set: max 1 mark) (2)	12.1.2 (1) 12.4.4 (1) L1
1.4.2	Iran ✓✓A	2A correct country (extra country: 0 marks) (2)	12.4.4 L 1
1.4.3	Saudi Arabia ✓✓A	2A correct country (2)	12.4.4 L1
			[34]

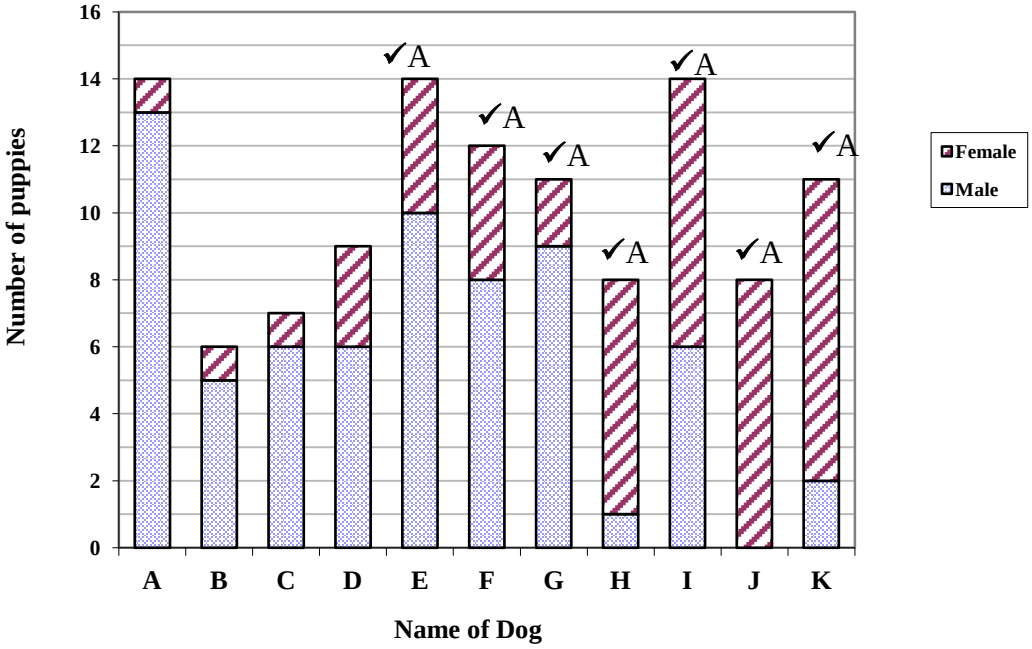
QUESTION 2 [29 MARKS]			
Ques	**Solution**	**Explanation**	**AS/L**
2.1.1	$\frac{1}{3} \times 24 = 8$ ✓M ✓A	1M multiplying 1A simplification Correct answer only: full marks (2)	12.1.1 L1
2.1.2	Spotted sector ✓✓A	2A correct sector (accept dotted sector, black & white sector) (2)	12.4.5 L2
2.1.3 (a)	Circumference $= 2 \times 3{,}14 \times 60$ cm ✓SF $= 376{,}8$ cm ✓CA (Using π: 376,99 cm)	1SF substitution 1CA simplification (2)	12.3.1 L1
2.1.3 (b)	Area of a sector of a circle $= \frac{3{,}14 \times 60^2}{24}$ cm² ✓SF $= \frac{11304}{24}$ cm² ✓CA $= 471$ cm² ✓A (using π: 471,24 cm²)	1SF substitution [refer to radius used in 2.1.3 (a)] 1CA simplification 1A square unit shown anywhere in solution (3)	12.3.1 L1
2.2.1	Percentage increase in time $= \frac{\textbf{Difference in time}}{\textbf{original time}} \times \textbf{100\%}$ $= \frac{1{,}56 - 1{,}2}{1{,}2} \times 100\%$ ✓SF ✓SF $= 30\ \%$ ✓CA **OR** 0,3	1SF difference in time 1SF substituting 1,2 1CA simplification (no subtraction no CA) (3)	12.1.1 L2
2.2.2	Distance = (27,95 × 1,36) m ✓SF = 38,012 m ≈ 38,01 m ✓A (any one)	1SF substitution 1A simplification (2)	12.2.1 L1

Ques	Solution	Explanation	AS/L
2.3.1	09:00 or nine o' clock or 9 am ✓✓RG	1RG reading from graph (2)	12.2.3 L1
2.3.2	Mr Nobi ✓RG	1RG reading from graph (1)	12.2.3 L2
2.3.3	2 hours or 3 hours ✓✓RG	2RG reading from graph (2)	12.2.3 L2
2.3.4	10:47 ✓✓RG (accept any time from 10:45 to 10:50)	2RG reading from graph (2)	12.2.3 L2
2.3.5	09:00 or nine o' clock or 9 am ✓✓RG	2RG reading from graph (2)	12.2.3 L2
2.4.1	Service fee (in rand) = 3,50 + 1,20% of the transaction amount = 3,50 + 1,20% × 344,50 ✓SF = 3,50 + 4,134 ✓A ≈ 7,63 ✓CA	1SF substituting 344,50 1A simplification 1CA amount to the nearest cent Correct answer only if correctly rounded : full marks (3)	12.2.1 L1 (2) L2 (1)
2.4.2	Amount (in rand) $= \frac{\textbf{Service fee } - \textbf{ 3,50}}{\textbf{1,20\%}}$ $= \frac{11,85 - 3,50}{1,20\%}$ ✓SF $= \frac{8,35}{0,012}$ ✓A ≈ 695,83 ✓CA	1SF substitution of 11,85 1A simplification 1CA amount to the nearest cent (3)	12.2.3 L1
			[29]

QUESTION 3 [16 MARKS]			
Ques	**Solution**	**Explanation**	**AS/L**
3.1.1	R19 900 deposit + R3 599,85 × 60 months = R19 900 + R215 991 ✓S = R235 891 ✓CA	1S simplification 1CA simplification Correct answer only: full marks (2)	12.1.3 L1
3.1.2	$A = P(1-i)^n$ $= R51\ 600\ (1-13,5\%)^2$ ✓SF $= R38\ 608,41$ ✓CA $\approx R38\ 600$ ✓R	1 SF correct substitution 1CA simplification 1 R rounding to the nearest R100 Correct answer only: full marks (3)	12.1.3 L2
3.2.1	12,5 ℓ ✓A	1A conclusion (1)	12.2.1 L1
3.2.2	Petrol consumption (in litre per 100 km) $= \frac{\text{distance covered}}{100} \times 12,5$ $= \frac{325}{100} \times 12,5$ ✓SF $= 40,625$ $\approx 40,63$ } ✓CA (any one) **OR** Petrol consumption (in litre per 100 km) $= 12,5 \times 3,25$ ✓SF $= 40,625$ $\approx 40,63$ } ✓CA (any one)	1SF substitution 1CA simplification 1SF substitution of factor 3,25 1CA simplification Correct answer only: full marks (2)	12.2.1 L2

Ques	Solution	Explanation	AS/L
3.3.1	✓A✓A ✓A ✓A C 4 **OR** 4 C	1A C 1A 4 (2)	12.3.4 L2
3.3.2	✓A ✓A Long Street and Marsh Street (or High Street)	2A any two correct (1 Penalty if other street names are given) (2)	12.3.4 L1
3.3.3	Right ✓✓A (accept Easterly direction)	2A conclusion (2)	12.3.4 L2
3.3.4	1 cm represents 0,3 km ✓M ✓A ∴ 8,9 cm represents 0,3 km × 8,9 = 2,67 km **OR** 1 : 0,3 ∴ 8,9: 0,3 × 8,9 ✓M ∴ 8,9 : 2,67 ✓A	1M multiplying by 8,9 1 A simplification 1M multiplying by 8,9 1 A simplification (If unit is incorrect: 1 mark) (2)	12.3.3 L2
			[16]

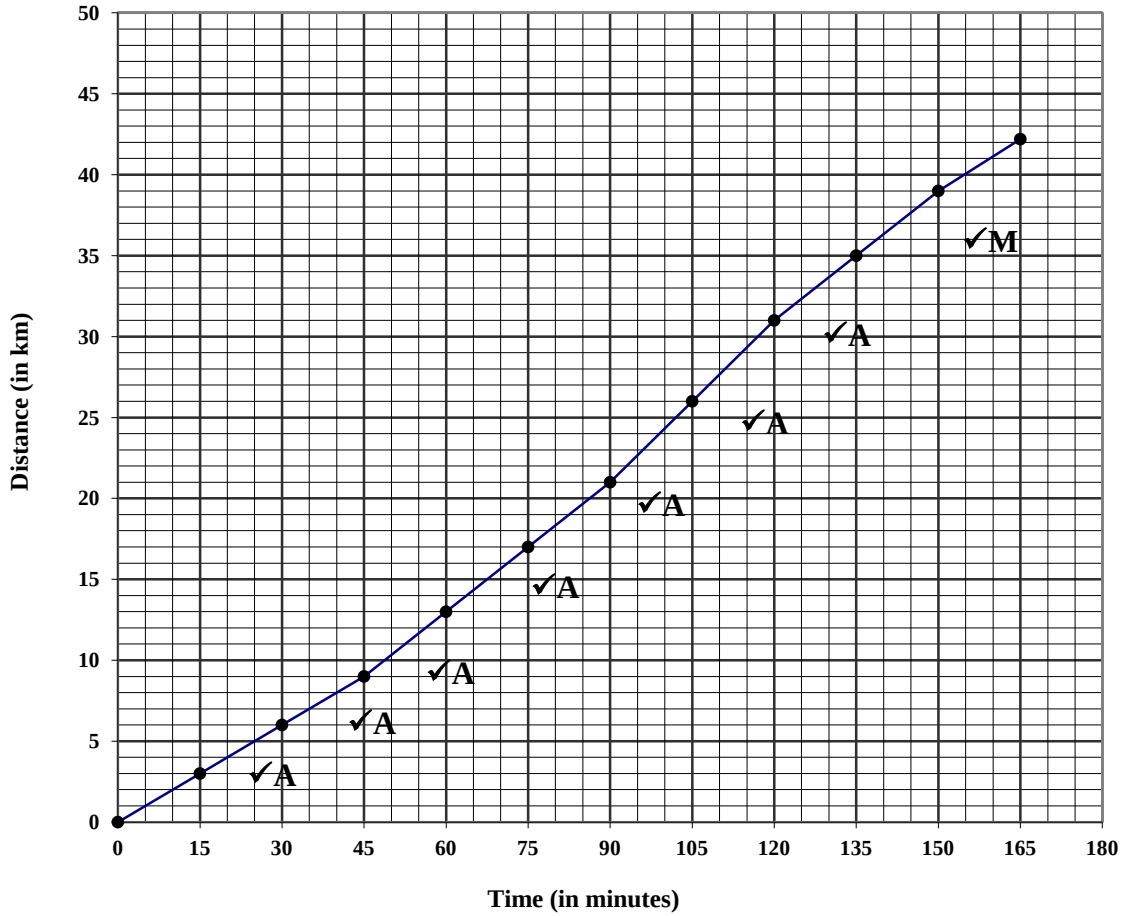
QUESTION 4 [24 MARKS]			
Ques	**Solution**	**Explanation**	**AS/L**
4.1.1	6 7 8 8 9 11 11 12 14 14 14 ✓M ✓A	1M ascending order 1 A all correct (descending order: 1 mark, one number omitted: 1 mark, Using names of the dogs: 1 mark) (2)	12.4.3 L1
4.1.2	Dog K ✓✓A	2A conclusion (Dog G: give 1 mark) (2)	12.1.1 (1) 12.4.4 (1) L1
4.1.3	14 ✓✓A	2A mode **OR** CA from 4.1.1 (2)	12.4.3 L1
4.1.4	Range = 9 – 1 ✓M = 8 ✓CA	1M identifying 1 and 9 1CA range (2)	12.4.3 L2
4.1.5	Mean = $\frac{13+5+6+6+10+8+9+1+6+0+2}{11}$ ✓M ✓M = $\frac{66}{11}$ = 6 ✓ CA	1M sum of the values (no penalty for omitting 0) 1M dividing by 11 1CA mean Correct answer only: full marks (3)	12.4.3 L2
4.1.6	10 : 4 ✓A = 5 : 2 ✓CA	1A correct ratio 1CA simplified ratio (unit ratio 1: 0,4 or 2,5 : 1 give 1 mark; written as a fraction 0 marks; Inverting the ratio 1 mark) Correct answer only: full marks (2)	12.1.1 (1) 12.4.4 (1) L1

Ques	Solution	Explanation	AS/L
4.1.7	**THE LITTER SIZE OF 11 DOGS**  1A for each bar drawn correctly (correct litter size only, max 3 marks) (7)		12.4.2 L2
4.2.1	✓M 105 cm × 1,25 **OR** 105 cm × $\frac{125}{100}$ ✓M = 131,25 cm ✓A = 131,25 cm ✓A	1M multiplying 1A length Correct answer only: full marks (2)	12.3.1 L1
4.2.2	6 × 2,5 cm ✓M = 15 cm ✓A	1M multiplying 1A height Correct answer only: full marks (2)	12.3.2 L2
			[24]

QUESTION 5 [19 MARKS]	**Once off penalty for rounding off**		
Ques	**Solution**	**Explanation**	**AS/L**
5.1.1	7 ✓ A	1A conclusion (1)	12.3.1 L1
5.1.2	70 mm : 7 000 mm ✓M/A = 1: 100 ✓CA	1M/A correct ratio 1CA simplification (2) Note: AFRIKAANS additional options	12.3.1 L1
5.1.3	10 714 mm – 1 200 mm ✓M/A = 9 514 mm ✓CA **OR** ✓M ✓CA Perimeter = 7 000 + 9 514 + 7 000 + 9 514 = 33 028 mm	1M/A subtraction 1CA simplification **OR** 1 M finding perimeter 1 CA simplification (no penalty for units) (2)	12.3.1 L1
5.1.4	72% × 39,54 m^2 ✓M ≈ 28,47 m^2 ∴ area of the kitchen = 39,54 m^2 – 28,47 m^2 ✓M = 11,07 m^2 ✓CA **OR** 100% – 72% = 28% ✓M ∴ area of the kitchen =28% × 39,54 m^2 ✓M ≈ 11,07 m^2 ✓CA	1M % concept 1M concept of decrease of area 1CA simplification **OR** 1M concept of decrease of % 1M % concept 1CA simplification (no penalty for units) (3)	12.3.1 L2

Ques	Solution	Explanation	AS/L
5.2.1	cement : stone = 1 : 4 1,5 bags of cement = 1,5 wheelbarrows of cement For $1\frac{1}{2}$ wheelbarrows of cement, ✓M she will need $4 \times 1\frac{1}{2}$ wheelbarrows of stone ✓M = 6 wheelbarrows of stone ✓CA	1M concept 1M multiply by 4 1CA simplification Correct answer only: full marks (3)	12.3.1 L2
5.2.2	Volume of the step = Area of the trapezium × height of the step = 2,52 m^2 × 0,12 m ✓SF = 0,3024 m^3 ≈ 0,30 m^3 ✓A or 0,3	1SF substitution 1A simplification (no penalty for units) (2)	12.3.1 L2
5.2.3	Total tiled area (in m^2) = A + (2s+f)× h = 2,52 + (2 ×1,6+1,3) × 0,12 ✓✓SF = 3,06 ✓CA ≈ 3,1 ✓R	1 SF substitution two correct 1 SF substitution another two correct 1CA simplification 1R rounding (4)	12.3.1 L2
5.2.4	Total length of the strip = 1,3 m + 2 × 1,6 m ✓SF = 4,5 m ✓CA	1SF substitution 1CA simplification (2)	12.2.1 L1
			[19]

QUESTION 6 [28 MARKS]			
Ques	**Solution**	**Explanation**	**AS/L**
6.1	In 4 minutes she covers 450 m $\therefore$ 1 minute she covers $\frac{450}{4}$ m = 112,5 m ✓M $\therefore$ in 9 minutes she covers 112,5 $\times$ 9 m = 1 012,5 m ✓CA **OR** 4 minutes: 450 m ✓M 9 minutes: $\frac{450 \times 9}{4}$ m = 1012,5 m ✓CA	1M working with ratio 1CA simplification **OR** 1M working with ratio 1CA simplification (2)	12.1.1 L1
6.2	Grams of carbohydrate = 2,27 ✓A $\times$ 65 ✓M = 147,55 ✓CA	1A using 2,27 1M multiplying 1CA simplification Correct answer only: full marks (3)	12.1.1 L2
6.3.1	165 minutes ✓RT	1RT reading from table (1)	12.2.3 L1
6.3.2	Average pace (in km per minute) = $\frac{21-13}{90-60}$ ✓SF ✓SF = $\frac{8}{30}$ = $\frac{4}{15}$ ✓S $\approx$ 0,27 ✓CA	1SF distances 1SF times 1S simplification 1CA average pace (if inverted, max 2 marks; if using other values from the table, max 2 marks) (4)	12.2.3 L1

Ques	Solution	Explanation	AS/L
6.3.3	**GRACIA'S PLAN FOR THE RACE**  No penalty for omitting (0;0) and joining 6A any 6 points plotted correctly 1A all correct points joined 1M correct shape (not a straight line) If only a Bar graph is correctly drawn - max 4 marks (8)		12.2.2 L1

<table>
<tr><th>Ques</th><th>Solution</th><th>Explanation</th><th>AS/L</th></tr>
<tr><td>6.4.1</td><td>
<table>
<tr><th>ATHLETIC CLUB</th><th>FREQUENCY</th></tr>
<tr><td>Liberty</td><td>5 ✓A</td></tr>
<tr><td>Striders</td><td>5 ✓A</td></tr>
<tr><td>Ramblers</td><td>4 ✓A</td></tr>
<tr><td>Harmony</td><td>6 ✓A</td></tr>
</table>
</td><td>4A one mark for each correct frequency
(just tallies or frequencies as fractions :MAX 2 marks)
(4)</td><td>12.4.2
L1</td></tr>
<tr><td>6.4.2
(a)</td><td>Striders Club = 100% – (8 + 35 + 12 + 29)% ✓M/A
= 16% ✓CA</td><td>1M/A subtracting from 100%
1CA simplification
Correct answer only: full marks
(2)</td><td>12.4.2
L1</td></tr>
<tr><td>6.4.2
(b)</td><td>Liberty or club E or E ✓✓A</td><td>2A correct club
(2)</td><td>12.4.4
L1</td></tr>
<tr><td>6.4.2
(c)</td><td>Actual number of Ramblers athletes
= 12% × 300 ✓M/A
= 36 ✓CA</td><td>1M/A calculating actual number
1CA simplification
(2)</td><td>12.4.4
L1</td></tr>
<tr><td></td><td></td><td></td><td>[28]</td></tr>
</table>

TOTAL: 150