



# 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  
**MR MA HENDRICKS**  
15 NOVEMBER 2012

EXTERNAL MODERATOR  
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15 NOVEMBER 2012


INTERNAL MODERATOR  
**MRS J SCHEIBER**  
15 NOVEMBER 2012

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

Ques	Solution	Explanation	AS/L
1.2	$21 + 30 + 9 \checkmark\checkmark A$ $= 60 \checkmark CA$	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	$3 \times R14,95 \checkmark M/A$ $= R44,85 \checkmark CA$  <b>OR</b> $R167,45 - 24,95 - 97,65 \checkmark M/A$ $= R44,85 \checkmark CA$	1M/A multiplying  1CA simplification (CA only when using R14,95 or multiplying 3 with a price on the slip) <b>OR</b> 1M/A subtracting the values from the total 1CA the amount (2)	12.1.3 L1
1.3.2	$\frac{97,65}{13,95} \checkmark M/A$ $= 7 \text{ bangles} \checkmark CA$	1M/A dividing  1CA simplification (2)	12.1.3 L1
1.3.3	$R24,95 - R21,89 \quad \text{OR} \quad 14\% \text{ of } R21,89 \checkmark M/A$ $= R3,06 \checkmark CA$  <b>OR</b> $\checkmark M/A$ $R24,95 \times \frac{14}{114} = R3,06 \checkmark CA$	1M/A subtracting/ calculating percentage 1CA simplification to the nearest cent  <b>OR</b> 1 M/A multiplying 1 CA simplification to the nearest cent (2)	12.1.3 L1

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

<b>QUESTION 2 [29 MARKS]</b>			
<b>Ques</b>	<b>Solution</b>	<b>Explanation</b>	<b>AS/L</b>
2.1.1	$\frac{1}{3} \times 24 = 8$	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 $\pi$ : 376,99 cm)	1SF substitution 1CA simplification (2)	12.3.1 L1
2.1.3 (b)	Area of a sector of a circle = $\frac{3,14 \times 60^2}{24}$ cm <sup>2</sup> ✓SF = $\frac{11304}{24}$ cm <sup>2</sup> = 471 cm <sup>2</sup> ✓CA (using $\pi$ : 471,24 cm <sup>2</sup> )	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 = $\frac{\text{Difference in time}}{\text{original time}} \times 100\%$ = $\frac{1,56 - 1,2}{1,2} \times 100\%$ ✓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 = $(27,95 \times 1,36)$ m ✓SF = 38,012 m } ✓A (any one) ≈ 38,01 m }	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) = $\frac{\text{Service fee} - 3,50}{1,20\%}$ = $\frac{11,85 - 3,50}{1,20\%}$ ✓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]

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

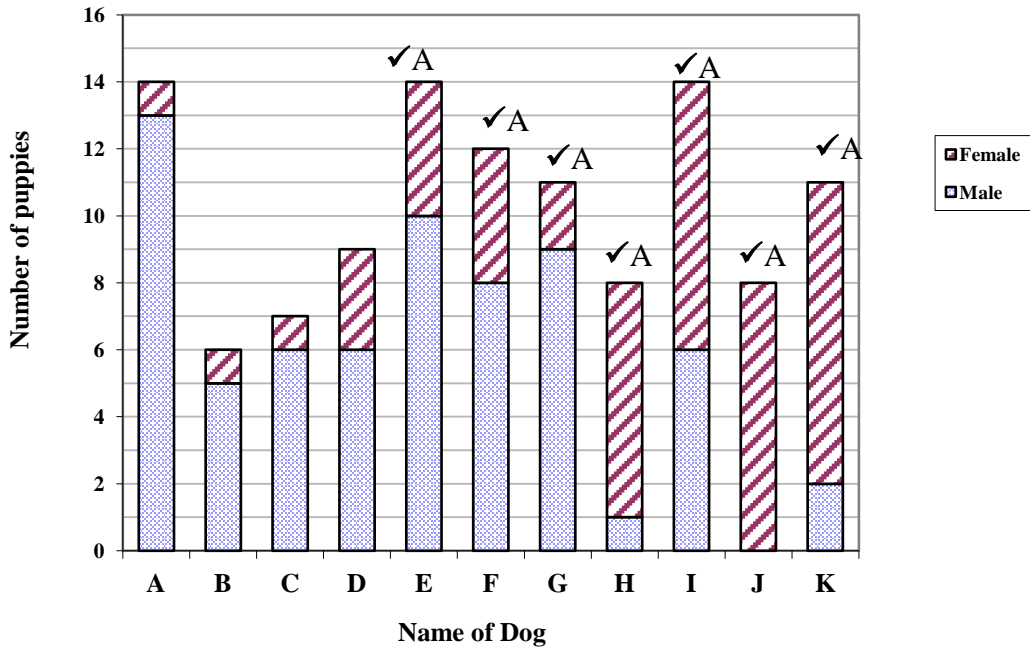



Ques	Solution	Explanation	AS/L
3.3.1	$\checkmark A \checkmark A$ $\checkmark A \checkmark A$ C 4 <b>OR</b> 4 C	1A C 1A 4 (2)	12.3.4 L2
3.3.2	$\checkmark A$ $\checkmark A$ Long Street and Marsh Street      (or High Street)	2A any two correct (1 Penalty if other street names are given) (2)	12.3.4 L1
3.3.3	Right $\checkmark \checkmark A$ (accept Easterly direction)	2A conclusion (2)	12.3.4 L2
3.3.4	1 cm represents 0,3 km $\checkmark M$ $\checkmark A$ $\therefore 8,9 \text{ cm represents } 0,3 \text{ km} \times 8,9 = 2,67 \text{ km}$ <b>OR</b> $1 : 0,3$ $\therefore 8,9 : 0,3 \times 8,9 \checkmark M$ $\therefore 8,9 : 2,67 \checkmark A$	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
			<b>[16]</b>







<b>QUESTION 4 [24 MARKS]</b>			
<b>Ques</b>	<b>Solution</b>	<b>Explanation</b>	<b>AS/L</b>
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 <b>OR</b> 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 = $\frac{66}{11}$ = 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	<p style="text-align: center;"><b>THE LITTER SIZE OF 11 DOGS</b></p>  <p style="text-align: center;"><b>Number of puppies</b></p> <p style="text-align: center;"><b>Name of Dog</b></p> <p style="text-align: center;"> <span style="border: 1px solid black; padding: 2px;">■ Female</span>  <span style="border: 1px solid black; padding: 2px;">■ Male</span> </p> <p style="text-align: center;">  </p> <p>1A for each bar drawn correctly</p> <p>(correct litter size only, max 3 marks)</p>		12.4.2 L2
4.2.1	$105 \text{ cm} \times \overset{\check{M}}{1,25}$ $= 131,25 \text{ cm} \quad \check{A}$ <p style="text-align: center;"><b>OR</b></p> $105 \text{ cm} \times \frac{\overset{\check{M}}{125}}{100}$ $= 131,25 \text{ cm} \quad \check{A}$	<p>1M multiplying</p> <p>1A length</p> <p>Correct answer only: full marks</p> <p style="text-align: right;">(2)</p>	12.3.1 L1
4.2.2	$6 \times 2,5 \text{ cm} \quad \check{M}$ $= 15 \text{ cm} \quad \check{A}$	<p>1M multiplying</p> <p>1A height</p> <p>Correct answer only: full marks</p> <p style="text-align: right;">(2)</p>	12.3.2 L2
			<b>[24]</b>

<b>QUESTION 5 [19 MARKS]</b>		<b>Once off penalty for rounding off</b>	
<b>Ques</b>	<b>Solution</b>	<b>Explanation</b>	<b>AS/L</b>
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)  <b>Note: AFRIKAANS additional options</b>	12.3.1 L1
5.1.3	10 714 mm – 1 200 mm ✓M/A = 9 514 mm ✓CA  <b>OR</b>  $\text{Perimeter} = 7\,000 + 9\,514 + 7\,000 + 9\,514 = 33\,028 \text{ mm}$ <p style="text-align: center;"> <math>\checkmark</math>M                    <math>\checkmark</math>CA                 </p>	1M/A subtraction 1CA simplification  <b>OR</b>  1 M finding perimeter 1 CA simplification (no penalty for units) (2)	12.3.1 L1
5.1.4	$72\% \times 39,54 \text{ m}^2$ ✓M $\approx 28,47 \text{ m}^2$ $\therefore$ area of the kitchen = $39,54 \text{ m}^2 - 28,47 \text{ m}^2$ ✓M = $11,07 \text{ m}^2$ ✓CA  <b>OR</b>  $100\% - 72\% = 28\%$ ✓M $\therefore$ area of the kitchen = $28\% \times 39,54 \text{ m}^2$ ✓M $\approx 11,07 \text{ m}^2$ ✓CA	1M % concept  1M concept of decrease of area 1CA simplification  <b>OR</b>  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, $\checkmark$ M she will need $4 \times 1\frac{1}{2}$ wheelbarrows of stone $\checkmark$ M = 6 wheelbarrows of stone $\checkmark$ 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 $\times$ height of the step = $2,52 \text{ m}^2 \times 0,12 \text{ m}$ $\checkmark$ SF = $0,3024 \text{ m}^3$ $\approx 0,30 \text{ m}^3$ $\checkmark$ A or 0,3	1SF substitution 1A simplification (no penalty for units) (2)	12.3.1 L2
5.2.3	Total tiled area (in $\text{m}^2$ ) = $A + (2s+f) \times h$ = $2,52 + (2 \times 1,6 + 1,3) \times 0,12$ $\checkmark\checkmark$ SF = 3,06 $\checkmark$ CA $\approx 3,1$ $\checkmark$ 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 = $1,3 \text{ m} + 2 \times 1,6 \text{ m}$ $\checkmark$ SF = $4,5 \text{ m}$ $\checkmark$ CA	1SF substitution 1CA simplification (2)	12.2.1 L1
			[19]

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

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

(8)

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

**TOTAL: 150**