



education

Department:
Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

MATHEMATICAL LITERACY P1

NOVEMBER 2009

MEMORANDUM

MARKS: 150

Symbol	Explanation
M	Method
MA	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 16 pages.

**EXTERNAL MODERATOR
MR M.A. HENDRICKS**

**INTERNAL MODERATOR
MRS J. SCHEIBER**

QUESTION 1 [26]				
Ques	Solution		Explanation	AS
1.1.1	$464 : 128$ $(\div 16) \quad 29 : 8 \quad \checkmark A$		1A solution (1)	12.1.1
1.1.2	$\frac{379}{250} = 1,516 \quad \checkmark A$ $\approx 1,52 \quad \checkmark CA$		1A solution 1CA rounding off (2) <div style="border: 1px solid black; padding: 2px; width: fit-content;"> ANSWER ONLY – FULL MARKS 1,5 or 1,51 – 1 mark Any other incorrect answer - 0 </div>	12.1.1
1.1.3	$\checkmark A$ $7 + \frac{1}{3}(57)$ $= 7 + 19 \quad \checkmark A$ $= 26 \quad \checkmark CA$	OR $\checkmark A$ $7 + \frac{57}{3} = \frac{21+57}{3} \quad \checkmark A$ $= \frac{78}{3}$ $= 26 \quad \checkmark CA$	1A square root 1A simplifying brackets and dividing 1CA simplification (3) <div style="border: 1px solid black; padding: 2px; width: fit-content;"> ANSWER ONLY – 2 marks </div>	12.1.1
1.1.4	$1,25 \times 1\,000 \text{ ml} \quad \checkmark M$ $= 1\,250 \text{ ml} \quad \checkmark A$		1M multiplying by 1 000 1A accurate conversion (2) <div style="border: 1px solid black; padding: 2px; width: fit-content;"> ANSWER ONLY – FULL MARKS No penalty if units are omitted </div>	12.3.2
1.1.5	$16\% \text{ of } 1\,255 \text{ kg} = \frac{16}{100} \times 1\,255 \text{ kg} \quad \checkmark M$ $= 200,8 \text{ kg} \quad \checkmark A$ New amount $= 1\,255 \text{ kg} + 200,8 \text{ kg}$ $= 1\,455,8 \text{ kg} \quad \checkmark CA$ OR 16% increase = 1,16 $\checkmark A$ New amount = $1,16 \times 1\,255 \text{ kg} \quad \checkmark M$ $= 1\,455,8 \text{ kg} \quad \checkmark CA$		1M calculating % 1A solution 1CA increase in % 1A total % 1M multiplying 1CA solution (3) <div style="border: 1px solid black; padding: 2px; width: fit-content;"> ANSWER ONLY – FULL MARKS No penalty if units are omitted </div>	12.1.1 12.3.1

Ques	Solution	Explanation	AS
1.1.6	$\$1 = R10,52$ $\$1\ 215,00 = R10,52 \times 1\ 215,00$ $= R12\ 781,80$	$\checkmark M$ 1M multiplying 1CA simplification (2) ANSWER ONLY – FULL MARKS	12.1.3
1.2.1	$\frac{R\ 399,00}{30}$ $\checkmark MA$ $= R13,30$ $\checkmark A$ OR Total number of grams in a box = $500\ g \times 30$ $= 15\ 000\ g$ $\checkmark MA$ Cost of 500 g = $\frac{R399,00}{15000} \times 500$ $= R13,30$ $\checkmark A$	1MA dividing 1A simplification 1MA multiplying 1A simplification (2) ANSWER ONLY – FULL MARKS	12.1.1
1.2.2	1 or 100% or certain $\checkmark\checkmark A$	2A correct probability (2) ANSWER WRITTEN AS A RATIO – 1 mark	12.4.5
1.2.3	Temp in $^{\circ}F = \frac{9}{5} \times 225^{\circ} + 32^{\circ}$ $\checkmark SF$ $= 405^{\circ}F + 32^{\circ}F$ $= 437^{\circ}F$ $\checkmark S$ $\approx 435^{\circ}F$ $\checkmark CA$	1SF substitution in formula 1S simplification 1CA rounded off to 5 degrees (3) ANSWER ONLY – FULL MARKS	12.3.2

Ques	Solution	Explanation	AS
1.3.1	<p>Cost price of 1 orange = $\frac{R\ 9,00}{12}$ ✓M</p> <p style="padding-left: 100px;">= R0,75 ✓CA</p> <p>OR</p> <p>Cost price of 1 orange = $\frac{R9,00 \times 100}{12}$ ✓M</p> <p style="padding-left: 100px;">= 75 cents ✓CA</p>	<p>1M division by 12</p> <p>1CA simplification (2)</p> <div style="border: 1px solid black; padding: 2px; margin-top: 10px;"> <p>ANSWER ONLY – FULL MARKS</p> <p>0,75 with no units – 2 marks</p> <p>75 with no units – 1 mark</p> </div>	12.1.1
1.3.2	<p>1 dozen oranges sell for R12,00 ✓A</p> <p>Profit = R12,00 – R9,00</p> <p style="padding-left: 40px;">= R3,00 ✓CA</p> <p>OR</p> <p>Selling price per orange = 100 cents</p> <p>Cost price per orange = 75 cents</p> <p>Profit per orange = 25 cents ✓A</p> <p>Profit per dozen orgaanges = 25 cents × 12</p> <p style="padding-left: 100px;">= 300 cents</p> <p style="padding-left: 100px;">= R3,00 ✓CA</p>	<p>1A selling price for 1 dozen</p> <p>1CA difference</p> <p>1A profit per orange</p> <p>1CA profit per dozen (2)</p> <div style="border: 1px solid black; padding: 2px; margin-top: 10px;"> <p>ANSWER ONLY – FULL MARKS</p> </div>	12.1.3

Ques	Solution	Explanation	AS
1.3.3	<p>Cost = $108 \times R0,75$ ✓CA = R81,00 ✓CA</p> <p style="text-align: center;">OR</p> <p>12 oranges cost R9,00</p> <p>108 oranges = $\frac{108 \times R9,00}{12}$ ✓M = R81,00 ✓CA</p> <p>OR</p> <p>Number of dozen = $\frac{108}{12} = 9$ ✓M</p> <p>Cost = 9 dozen \times R9,00 per dozen = R81,00 ✓CA</p>	<p>1CA cost per orange 1CA cost for 108 oranges</p> <p>1M finding number of dozens 1CA cost for 108 oranges</p> <p>1M dividing 1CA cost for 108 oranges (2)</p> <p style="text-align: center;">ANSWER ONLY – FULL MARKS</p>	12.1.1

QUESTION 2 [31]			
Ques	Solution	Explanation	AS
2.1.1	$D = 10 \text{ cm}$ ✓A	1A doubling the radius (1)	12.3.1
2.1.2	$L = 29,5 \text{ cm} - 2,5 \text{ cm} - 2,5 \text{ cm}$ ✓M/A $= 24,5 \text{ cm}$ ✓CA	1MA reducing 29,5 cm 1CA length of certificate (2) ANSWER ONLY – FULL MARKS Only subtract 2,5 once – 1 mark Use the width – 1 mark Using a length = 29,5 cm and having an answer less than 29,5cm - 1 mark	12.3.1
2.1.3	$A = \pi r^2$ $= 3,14 \times (5 \text{ cm})^2$ ✓SF $= 78,5 \text{ cm}^2$ ✓CA ✓A	1SF/CA substitution in formula (CA from 21.1.0) 1CA simplifying 1A unit (3) ANSWER ONLY – FULL MARKS Accept $\pi = \frac{22}{7}$ or π on the calculator	12.3.1
2.1.4	$P = 2(29,5 \text{ cm} + 21 \text{ cm})$ ✓SF $= 101 \text{ cm}$ ✓CA	1SF substitution in formula 1CA simplifying (2) ANSWER ONLY – FULL MARKS	12.3.1
2.1.5	$A = 29,5 \text{ cm} \times 21 \text{ cm}$ ✓SF $= 619,5 \text{ cm}^2$ ✓CA	1SF substitution in formula 1CA simplifying (2) ANSWER ONLY – FULL MARKS	12.3.1

Ques	Solution	Explanation	AS
2.2.1	$315 : 1\ 050 \checkmark\text{MA}$ $= 3 : 10 \quad \checkmark\text{CA}$	1MA ratio in correct order 1CA simplifying (2) <div style="border: 1px solid black; padding: 5px; width: fit-content;"> ANSWER ONLY – FULL MARKS 1 mark if one of the numbers is 1 Accept notation $\frac{3}{10}$ but refer to question 1.1 </div>	12.1.1
2.2.2	$\frac{2}{7} \times 315 \text{ guests} \checkmark\text{A}$ $= 90 \text{ guests} \quad \checkmark\text{CA}$	1A correct fraction 1CA simplifying (2) <div style="border: 1px solid black; padding: 5px; width: fit-content;"> CORRECT ANSWER ONLY – FULL MARKS </div>	12.1.1
2.2.3*	1 litre concentrate makes 5 litres of juice $\checkmark\text{MA}$ 5 litres concentrate makes $5 \times 5 \text{ l}$ $= 25 \text{ l} \quad \checkmark\text{CA}$ OR Number of litres of juice = $4 \times 5 \text{ l} + 1 \times 5 \text{ l}$ $= 20 \text{ l} + 5 \text{ l} \checkmark\text{MA}$ $= 25 \text{ l} \quad \checkmark\text{CA}$	1MA dilution ratio 1CA simplifying 1MA dilution ratio 1CA simplifying (2) <div style="border: 1px solid black; padding: 5px; width: fit-content;"> ANSWER ONLY – FULL MARKS 20 l – 1 mark </div>	12.1.1

Ques	Solution	Explanation	AS
2.3.1	Eastern Cape or A ✓A	1A correct province (1)	12.4.4
2.3.2	$D = 100\% - 15\% - 6\% - 13\% - 50\%$ ✓MA $= 16\% \text{ or } 0,16 \text{ or } \frac{16}{100}$ ✓CA	1MA setting up model 1CA simplifying (2) ANSWER ONLY – FULL MARKS	12.4.4
2.3.3	Gauteng or B ✓CA	1CA correct province (1) Check the answer to D (2.3.2)	12.4.4
2.3.4	$\frac{18}{100} \times 88\,144 \text{ vehicles}$ ✓MA ✓MA OR $0,18 \times 88\,144$ $= 15\,865,92 \text{ vehicles}$ ✓CA $\approx 15\,866 \text{ vehicles}$ ✓R	1MA 18% of vehicles stolen 1MA correct no. of vehicles 1CA simplifying the product 1R rounding (4) ANSWER ONLY – FULL MARKS	12.1.1 12.4.4
2.4.1 (a)	R750 ✓RG	1 RG reading from graph (1)	12.2.3
2.4.1 (b)	Loss ✓A	1A (1)	12.2.3
2.4.1 (c)	10 ✓✓RG	2RG reading from graph (2)	12.2.3
2.4.2	Percentage profit = $\frac{\text{Profit}}{\text{Expenses}} \times 100\%$ $= \frac{R400}{R850} \times 100\%$ ✓SF $= 47,0588 \dots\%$ ✓S $\approx 47,1\%$ ✓R	1SF substitution into formula 1S simplification 1R rounding off (3)	12.1.3 12.2.1

QUESTION 3 [19]																																			
Ques	Solution	Explanation	AS																																
3.1.1	17 years ✓A	1A modal age (1)	12.4.3																																
3.1.2	17 years ✓A	1A median (1)	12.4.3																																
3.1.3	Mean $= \frac{16 + 16 + 16 + 17 + 17 + 17 + 17 + 17 + 18 + 18 + 19 + 19 + 19 + 20 + 22}{15}$ $= \frac{268}{15} \text{ years}$ $= 17,8666 \dots \text{ years}$ $= 17,87 \text{ years}$	1M sum of values 1MA dividing by size of sample 1CA simplifying 1R rounding off (4) <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 5px auto;">ANSWER ONLY – FULL MARKS</div>	12.4.3																																
3.2.1 (a)	20% ✓A	1A lowest (1)	12.4.3																																
3.2.1 (b)	100% ✓A	1A highest (1)	12.4.3																																
3.2.2	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>PERFOR- MANCE LEVEL</th> <th>PERCENTAGE RANGE</th> <th>TALLY</th> <th>FRE- QUENCY</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>0 to 29</td> <td>////</td> <td>4</td> </tr> <tr> <td>2</td> <td>30 to 39</td> <td>###</td> <td>5</td> </tr> <tr> <td>3</td> <td>40 to 49</td> <td>### ### /</td> <td>11</td> </tr> <tr> <td>4</td> <td>50 to 59</td> <td>### ///</td> <td>8</td> </tr> <tr> <td>5</td> <td>60 to 69</td> <td>###</td> <td>5</td> </tr> <tr> <td>6</td> <td>70 to 79</td> <td>### ///</td> <td>8</td> </tr> <tr> <td>7</td> <td>80 to 100</td> <td>### ### /</td> <td>11</td> </tr> </tbody> </table>	PERFOR- MANCE LEVEL	PERCENTAGE RANGE	TALLY	FRE- QUENCY	1	0 to 29	////	4	2	30 to 39	###	5	3	40 to 49	### ### /	11	4	50 to 59	### ///	8	5	60 to 69	###	5	6	70 to 79	### ///	8	7	80 to 100	### ### /	11	1A learners in level 1 1A learners in level 2 1A learners in level 3 1A learners in level 4 1A learners in level 5 1A learners in level 6 1A learners in level 7 (7) <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> If cumulative frequency is correct, maximum of 3 marks. If addition shown in cumulative frequency, maximum of 4 Ignore cumulative frequency if both are given </div>	12.4.2
PERFOR- MANCE LEVEL	PERCENTAGE RANGE	TALLY	FRE- QUENCY																																
1	0 to 29	////	4																																
2	30 to 39	###	5																																
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5	60 to 69	###	5																																
6	70 to 79	### ///	8																																
7	80 to 100	### ### /	11																																

Ques	Solution	Explanation	AS
3.3.1	$52 \text{ learners} \times 1,6 \text{ m}^2/\text{learner} \quad \checkmark\text{M/A}$ $= 83,2 \text{ m}^2 \quad \checkmark\text{A}$	1M/A multiplication 1A simplifying (2) ANSWER ONLY – FULL MARKS	12.3.1
3.3.2	$\text{Number of learners} = \frac{96}{1,6} \quad \checkmark\text{M}$ $= 60 \text{ learners} \quad \checkmark\text{A}$	1M division/correct values 1A solution (2) ANSWER ONLY – FULL MARKS	12.3.1

QUESTION 4 [23]			
Ques	Solution	Explanation	AS
4.1.1	90 km ✓C ✓R	1C conversion to time 08:30 1R reading from table (2)	12.2.3
4.1.2	08:45 ✓✓RT	2RT reading from table (2)	12.2.3
4.1.3 (a)	Speed = $\frac{120 \text{ km}}{2 \text{ h}}$ ✓SF = 60 km/h ✓CA	1SF substitution into formula 1CA solution (2) ANSWER ONLY – FULL MARKS	12.2.1
4.1.3 (b)	72 minutes = 1,2 hours ✓A $\frac{\text{Distance}}{1,2 \text{ h}} = 80 \text{ km/h}$ ✓SF Distance = 80 × 1,2 km = 96 km ✓CA OR 60 minutes → 80 km ✓A 12 minutes → $\frac{12}{60} \times 80 \text{ km} = 16 \text{ km}$ ✓A 72 minutes = 80 km + 16 km = 96 km ✓CA	1A conversion to hours 1SF substitution into formula 1CA solution OR 1A distance for 1 hour 1A distance for 12 minutes 1CA distance for 72 minutes (3) ANSWER ONLY – FULL MARKS 80 X 72 - 1 Mark	12.2.1

Ques	Solution	Explanation	AS
4.1.4	<p style="text-align: center;">DISTANCE TRAVELLED AGAINST TIME TAKEN</p>	<p>Mr Lebelo – Mr Goldman</p> <p>1A starting point for Mr Lebelo at 07:15</p> <p>2A plot any 4 points</p> <p>1CA joining all points plotted</p> <p style="text-align: right;">(4)</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <p>CORRECT GRAPH WITHOUT PLOTTING INDIVIDUAL POINTS – FULL MARKS</p> </div>	12.2.2
4.1.5 (a)	<p>1 hour (in terms of Mr Goldman) ✓RG</p> <p>¾ hour or 45 minutes (in terms of Mr Lebelo)</p>	<p>1RG Reading from the graph or table</p> <p style="text-align: right;">(1)</p>	12.2.3
4.1.5 (b)	<p>60 km ✓RG✓RG</p>	<p>2RG Reading from the graph or table</p> <p style="text-align: right;">(2)</p>	12.2.3
4.1.5 (c)	<p>✓RG ✓RG</p> <p>100 km – 90 km ✓M</p> <p>= 10 km ✓CA</p>	<p>1M subtraction</p> <p>1RG reading from graph or table</p> <p>1RG reading from graph or table</p> <p>1CA simplifying</p> <p style="text-align: right;">(4)</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <p>ANSWER ONLY – FULL MARKS</p> </div>	12.2.3
4.2*	<p>Cost of petrol = 10 journeys × 8ℓ × R8,23 per ℓ</p> <p style="text-align: center;">= R658,40 ✓CA</p>	<p>1A Number of journeys</p> <p>1M multiplication</p> <p>1CA simplifying</p> <p style="text-align: right;">(3)</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <p>ANSWER ONLY – FULL MARKS</p> </div>	12.1.3

Question 5 [18]			
Ques	Solution	Explanation	AS
5.1.1	7,51 ; 7,51 ; 7,64 ; 7,71 ; 7,81 ; 7,91 ; 8,05 ; 8,22 ✓A ✓A	2A ascending order (2) <div style="border: 1px solid black; padding: 2px;">Descending order – 1 mark Leave off 1 value – 1 mark</div>	12. 4.2
5.1.2	7,51 metres ✓A	1A mode (1)	12. 4.3
5.1.3	Range = 8,02 m – 7,23 m ✓M = 0,79 m ✓CA	1M largest – smallest 1CA solution (2) <div style="border: 1px solid black; padding: 2px;">ANSWER ONLY – FULL MARKS</div>	12. 4.3
5.1.4	Shortest jump = 7,23 m ✓A 7,23 m = 7,23 × 100 cm ✓C ✓CA = 723 cm	1A shortest jump 1C conversion 1CA answer in cm (3) <div style="border: 1px solid black; padding: 2px;">ANSWER ONLY – FULL MARKS</div>	12. 3.2
5.1.5	Median = $\frac{7,64+7,82}{2}$ m ✓M = 7,73 m ✓A	1M method 1A solution (2) <div style="border: 1px solid black; padding: 2px;">ANSWER ONLY – FULL MARKS</div>	12. 4.3
5.1.6	Charles ✓✓A	2A solution (2)	12. 4.1
5.2	V = 9 m × 2,75 m × 0,07 m ✓SF = 1,7325 m ³ ✓CA ≈ 1,733m ³ ✓CA	1SF substitution 1CA simplification 1CA rounding off and correct unit (3) <div style="border: 1px solid black; padding: 2px;">ANSWER ONLY – FULL MARKS</div>	12. 3.1
5.3	August 1991 – October 1968 ✓MA = 22 years 10 months ✓CA ≈ 23 years ✓CA	Also accept 1991 – 1968 = 23 years 1MA method 1CA solution 1CA rounding off (3) <div style="border: 1px solid black; padding: 2px;">ANSWER ONLY – FULL MARKS</div>	12. 1.1 12. 4.4

Ques	Solution	Explanation	AS															
6.1.4	<p style="text-align: center;">GRANT TYPES AS A PERCENTAGE OF TOTAL GRANTS RECEIVED</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <caption>Data from Bar Chart</caption> <thead> <tr> <th>Types of grants</th> <th>2005 (%)</th> <th>2007 (%)</th> </tr> </thead> <tbody> <tr> <td>Old-age</td> <td>22</td> <td>18</td> </tr> <tr> <td>Child support</td> <td>60</td> <td>66</td> </tr> <tr> <td>Disability</td> <td>14</td> <td>12</td> </tr> <tr> <td>Other</td> <td>4</td> <td>4</td> </tr> </tbody> </table>	Types of grants	2005 (%)	2007 (%)	Old-age	22	18	Child support	60	66	Disability	14	12	Other	4	4	<p>1A Old-age 2007 (accept 18%)</p> <p>1A Child support in 2007 (accept 66%)</p> <p>1A Disability in 2007 (accept 12%)</p> <p>1A Other 2007 (accept 4%)</p> <p><i>(take out bold lines in English memo)</i></p>	12.4.2
Types of grants	2005 (%)	2007 (%)																
Old-age	22	18																
Child support	60	66																
Disability	14	12																
Other	4	4																
6.2.1	$\frac{30}{960} \checkmark RT$ $= \frac{1}{32} \text{ OR } 0,03 \text{ OR } 3,13\% \checkmark M$	<p>1RT reading correct value for burial policy</p> <p>1M dividing value by total</p> <p>1S simplifying</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 5px auto;">ANSWER ONLY FULL MARKS</div>	12.1.1															
6.2.2	$R960 - R15,45 - R24,50 - R60,00 - R30,00 - R40,00 - R86,40$ $= R703,65 \checkmark CA$	<p>1RT correct values</p> <p>1M method</p> <p>1CA simplifying</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 5px auto;">ANSWER ONLY FULL MARKS</div>	12.1.1															

QUESTION 7 [15]			
Ques	Solution	Explanation	AS
7.1.1 (a)	$A = 2 \times 3 + 1$ ✓SF $= 7$ ✓CA	1 SF substitution into formula 1CA value of A (2) ANSWER ONLY – FULL MARKS	12.2.1
7.1.1 (b)	$10 = B \times 3 + 1$ ✓SF $3B = 9$ ✓S $B = 3$ ✓CA OR $10 = 3 \times 3 + 1$ ✓SF ✓S $\therefore B = 3$ ✓CA	1 SF substitution into formula 1S simplifying equation 1CA value of B 1SF substitution into formula 1S simplifying equation 1CA value of B (3) ANSWER ONLY – FULL MARKS	12.2.1
7.1.2	St Patrick's College ✓RT✓RT	2RT reading from the table (2)	12.2.3
7.2.1	C2 (or 2C) ✓RG	1RG reading from the map (1)	12.3.4
7.2.2**	From Kokstad College turn <i>right</i> /NE ✓A into <i>Elliot Street</i> . Continue At <i>Barclay Road</i> turn <i>right</i> / SE. ✓A Kokstad Rugby Club will be on the left.	2A correct directions (Street name and direction) (2)	12.3.4
7.2.3**	South-east/North-west ✓A	1A correct direction (1)	12.3.4
7.2.4	1 cm represents 20 000 cm ✓A Therefore, 5 cm would represent $5 \times 20\,000$ cm ✓M $= 100\,000$ cm ✓S $= 1\,000$ m ✓C	1A scale interpretation 1M multiplication 1S simplification 1C conversion (4) ANSWER ONLY – FULL MARKS	12.3.3

TOTAL: 150 marks