



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

MATHEMATICAL LITERACY P1

FEBRUARY/MARCH 2012

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 12 pages.

QUESTION 1 [33 MARKS]			
Ques	Solution	Explanation	AS
1.1.1	$\frac{3}{4}$ of $\sqrt{9\,673} - 0,5 (5,9352 + 2,16937)$ $= 73,763\,558.. - 4,052\,285$ $= 69,711\,273.. \checkmark A$ $\approx 69,71 \checkmark R$	1A simplifying 1R rounding off Answer only full marks (2)	12.1.1
1.1.2	22,25% of R136,00 $= \frac{22,25}{100} \times R136 \checkmark M$ $= R30,26 \checkmark CA$ OR $\frac{22,25}{100} \times R136 \checkmark M$ $= R30,26 \checkmark CA$	OR $\checkmark M$ $0,2225 \times R136$ $= R30,26 \checkmark CA$ 1M using percentage 1CA simplification Answer only full marks (2)	12.1.1
1.1.3	$450\text{ m} = (450 \div 1\,000)\text{ km}$ $= 0,45\text{ km} \checkmark A$	1A answer (1)	12.3.2
1.1.4	$5,34\text{ million} = 5,34 \times 1\,000\,000$ $= 5\,340\,000 \checkmark A$	1A solution (1)	12.1.1
1.1.5	Price per egg = $\frac{R7,92}{6} \checkmark M$ $= R1,32 \checkmark CA$	1M dividing by 6 1 CA simplification Answer only full marks (2)	12.3.2 12.1.1
1.1.6	Total number of days from Jan. to Jul. $= 31 + 28 + 31 + 30 + 31 + 30 + 31$ $= 212 \checkmark A$ So, the 200 th day is in July $\checkmark CA$	1A total days 1CA month Answer only full marks (2)	12.1.2 12.3.2

Ques	Solution	Explanation	AS
1.2.1	19:00 OR 7 pm OR 19H00 ✓✓A	2A answer (2)	12.1.1 12.3.1
1.2.2	Wage = R18,00 × 12 × 2½ ✓ SF = R540 ✓CA	1 SF substitution 1CA simplification Answer only full marks (2)	12.2.1
1.3.1	Total Income = profit + expenses = R135 400 + R235 656 ✓ SF = R371 056 ✓CA	1SF substitution 1CA simplification Answer only full marks (2)	12.2.1 12.1.1
1.3.2	Sihle's share = R135 400 – R54 160 = R81 240 ✓ A Ratio = 54 160 : 81 240 ✓M = 2 : 3 OR 1 : 1,5 ✓CA OR 27 080 : 40 620 OR 13 540 : 20 310 OR 5 416 : 8 124	1A Sihle's share 1M Writing as a ratio 1CA simplified ratio Accept any simplified form of the ratio (3)	12.1.1
1.3.3	An increase of 8% implies 108 % ✓M Profit in 2011 = $\frac{108}{100} \times R135\,400$ ✓A OR 1,08 × R135 400 = R146 232 ✓CA OR Increased amount = $\frac{8}{100} \times R135\,400$ OR 0,08 × R135 400 = R10 832 ✓A Profit in 2011 = R135 400 + R10 832 ✓M = R146 232 ✓CA	1M concept of increase 1A simplification 1CA solution 1A simplification 1M concept of increase 1CA solution Answer only full marks (3)	12.1.1

Ques	Solution	Explanation	AS
1.4.1	0; 24; 38; 38; 42; 50; 52; 56; 86 ✓A	1A answer (1)	12.4.2
1.4.2	38 ✓A	1A answer (1)	12.4.3
1.4.3	$\text{Mean} = \frac{52 + 86 + 24 + 38 + 56 + 42 + 0 + 50 + 38}{9}$ $= \frac{386}{9} \checkmark A$ $= 42,8888\dots$ $\approx 42,89 \checkmark R$	1M finding mean 1A adding 1R rounding Answer only full marks (3)	12.4.3
1.5.1	Internet ✓RG	1RG reading from the graph (1)	12.4.4
1.5.2	Difference = 60,5% – 48,4% ✓ M = 12,1% ✓ A	1M subtracting 1A solution Answer only full marks (2)	12.4.4 12.1.1
1.5.3	Computers ✓RG	1RG reading from the graph (1)	12.4.4
1.5.4	Number of schools = $\frac{24,6}{100} \times 2\,500 \checkmark M$ $= 0,246 \times 2\,500$ $= 615 \checkmark CA$	1 M % calculation 1 CA simplification Answer only full marks (2)	12.1.1

QUESTION 2 [32 MARKS]			
Ques	Solution	Explanation	AS
2.1.1	$A = R150\,000(1 + 0,066)^3 \checkmark_{SF}$ $= R181\,703,32 \checkmark_{CA}$	2 SF substitution 1 CA solution (3)	12.1.1
2.1.2	$R1,00 \text{ (ZAR)} = \text{¥} 0,89 \text{ (CNY)}$ $\text{Amount} = 15\,000 \times 0,89 \checkmark_{M}$ $= \text{¥} 13\,350 \text{ CNY} \checkmark_{A}$	1M multiplying 1 A solution (2)	12.1.1
2.2.1 a	$\text{Number of coloureds} = 4\,424\,100 \quad \checkmark_{RT} \quad \checkmark_{A}$	1RT reading from table 1A writing correctly (2)	12.4.1
2.2.1 b	$\text{Number of white females} = 2\,277\,400 \quad \checkmark_{RT} \quad \checkmark_{A}$	1RT reading from table 1A writing correctly (2)	12.4.1
2.2.2	$A = 24\,329\,000 - (19\,314\,500 + 646\,600 + 2\,243\,000) \checkmark_{M}$ $= 2\,124\,900 \checkmark_{A}$ <p style="text-align: center;">OR</p> $A = 4\,424\,100 - 2\,299\,200 \quad \checkmark_{M}$ $= 2\,124\,900 \checkmark_{A}$ <p style="text-align: center;">OR</p> $B = 49\,320\,500 - (39\,136\,200 + 4\,433\,100 + 4\,472\,100) \checkmark_{M}$ $= 1\,279\,100 \checkmark_{A}$ <p style="text-align: center;">OR</p> $B = 635\,700 + 643\,400 \quad \checkmark_{M}$ $= 1\,279\,100 \checkmark_{A}$ <p style="text-align: center;">OR</p> $C = 39\,682\,600 + 4\,424\,100 + 1\,299\,900 + 4\,584\,700 \checkmark_{M}$ $= 49\,991\,300 \checkmark_{A}$ <p style="text-align: center;">OR</p> $C = 24\,329\,000 + 25\,662\,300 \checkmark_{M}$ $= 49\,991\,300 \checkmark_{A}$	1M subtracting 1A value of A OR 1M subtracting 1A value of A 1M subtracting 1A value of B OR 1M adding 1A value of B 1M adding 1A value of C OR 1M adding 1A value of C Answer only full marks (6)	12.4.1 12.1.1

Ques	Solution	Explanation	AS
2.2.3	Difference = 19 314 500 – 18 901 000 ✓RT = 413 500 ✓A	1RT reading values from table 1A answer Answer only full marks (2)	12.4.1 12.1.1
2.2.4	Asian females = $\frac{653\,300}{25\,662\,300} \times 100\%$ ✓RT = 2,546% = 2,55% ✓A	1RT reading values from table 1A simplification (2)	12.4.1 12.1.1
2.2.5	Male increase = 460 300 ✓A Female increase = 210 500 ✓A ∴ Males had the greatest increase ✓A	1A increase in males 1A increase in females 1A answer (3)	
2.3.1	R75 ✓ ✓RG (accept any amount between R73 and R77)	2RG reading from the graph (2)	12.2.3
2.3.2	24 single trips ✓ ✓RG	2RG reading from the graph (2)	12.2.3
2.3.3	Number of single trips = 3 × 2 = 6 ✓ A Cost = R 45 ✓ ✓RG (accept any amount between R43 and R47) OR ✓ ✓RG Cost of 3 single trips = R22,50 (accept any amount between R22 and R23) Cost of 3 return trips/6 single trips = 2 × R22,50 = R45,00 ✓ A (accept any amount between R43 and R47)	1A number of single trips 2RG reading from the graph OR 2RG reading from the graph 1A solution (3)	12.1.1 12.2.3
2.3.4	Cost of 22 single trips = R165,00 ✓ ✓RG (accept any amount between R163 and R167) Cost of 44 single trips /22 return trips = 2 × R165 ✓ A = R330 (accept any amount between R326 and R334)	2RG reading from the graph 1A solution (3)	12.1.1 12.2.3

QUESTION 3 [17 MARKS]			
Ques	Solution	Explanation	AS
3.1.1	$\text{Cost} = 3 \times \text{R}5,75 + 5 \times \text{R}1,25 \checkmark \text{SF}$ $= \text{R}23,50 \checkmark \text{CA}$	1SF substitution in formula 1CA solution (2)	12.2.1
3.1.2	$\text{Number of carrots} = \frac{\text{R}31,75 - (4 \times \text{R}5,75)}{\text{R}1,25} \checkmark \text{SF}$ $= \frac{\text{R}8,75}{\text{R}1,25}$ $= 7 \checkmark \text{CA}$	1SF substitution in formula 1CA simplification (2)	12.2.1
3.2.1	$\text{Area} = 2,5 \text{ m} \times 1,5 \text{ m} \checkmark \text{SF}$ $= 3,75 \text{ m}^2 \checkmark \text{CA}$	1SF substitution in formula 1CA solution (2)	12.3.1
3.2.2	$\text{Volume} = 2,5 \text{ m} \times 1,5 \text{ m} \times 7,5 \text{ cm} \checkmark \text{SF}$ $= 2,5 \text{ m} \times 1,5 \text{ m} \times 0,075 \text{ m} \checkmark \text{C}$ $= 0,28125 \text{ m}^3$ $\approx 0,28 \text{ m}^3 \checkmark \text{CA}$ <p>OR</p> $\text{Volume} = 3,75 \text{ m}^2 \times 7,5 \text{ cm} \checkmark \text{SF}$ $= 3,75 \text{ m}^2 \times 0,075 \text{ m} \checkmark \text{C}$ $= 0,28125 \text{ m}^3$ $\approx 0,28 \text{ m}^3 \checkmark \text{CA}$	1SF substitution in formula 1C conversion 1CA solution 1SF substitution in formula 1C conversion 1CA solution (3)	12.3.1 12.3.2

QUESTION 4 [28 MARKS]																											
Ques	Solution	Explanation	AS																								
4.1.1	$P = R600,00 \checkmark\checkmark A$ $Q = R800,00 + 1\ 000 \times R0,05 \checkmark SF$ $= R850 \checkmark A$	2 A value of P 1SF substitution 1 A solution (4)	12.2.1																								
4.1.2	Cost per month $\checkmark A$ $= R600,00 + (\text{number of copies more than } 2\ 500) \times R0,10$ $\checkmark A$ $\checkmark A$ $\checkmark A$ OR $\checkmark A$ $\checkmark A$ $\checkmark A$ $\text{Cost} = R600 + (n - 2\ 500) \times R0,10$ Where n is the number of copies more than 2 500	1A R600 1A more than 2 500 1A cost per copy OR 1A R600 1A more than 2 500 1A cost per copy (3)	12.2.1																								
4.1.3	<p style="text-align: center;">COST OF RENTING A PHOTOCOPIER</p> <table border="1"> <caption>Data points for Company A and B</caption> <thead> <tr> <th>Copies Made</th> <th>Company A Cost (rand)</th> <th>Company B Cost (rand)</th> </tr> </thead> <tbody> <tr><td>0</td><td>800</td><td>600</td></tr> <tr><td>2000</td><td>800</td><td>600</td></tr> <tr><td>3000</td><td>800</td><td>650</td></tr> <tr><td>4000</td><td>850</td><td>750</td></tr> <tr><td>6000</td><td>950</td><td>950</td></tr> <tr><td>7000</td><td>1000</td><td>1050</td></tr> <tr><td>8000</td><td>1050</td><td>1150</td></tr> </tbody> </table> <p>1A straight line starting at (0 ; 800) to (3 000 ; 800) 1A straight line from (3 000 ; 800) to (8 000 ; 1 050) 1A all points plotted correctly 1A label</p>		Copies Made	Company A Cost (rand)	Company B Cost (rand)	0	800	600	2000	800	600	3000	800	650	4000	850	750	6000	950	950	7000	1000	1050	8000	1050	1150	12.2.2
Copies Made	Company A Cost (rand)	Company B Cost (rand)																									
0	800	600																									
2000	800	600																									
3000	800	650																									
4000	850	750																									
6000	950	950																									
7000	1000	1050																									
8000	1050	1150																									

Ques	Solution	Explanation	AS												
4.1.4	6 000 copies ✓✓RT/ RG	2RG/RT reading from graph/table (2)	12.2.3												
4.1.5	Saving = R1 050 – R1 000 ✓RG/RT = R50 ✓CA Company A ✓A	1RT/RG reading 1 CA answer 1A answer (3)	12.2.3 12.1.1												
4.2.1	Stationery room ✓A Kitchen ✓A	1A correct 1A correct (2)	12.3.4												
4.2.2	Actual width = 1,33 cm × 300 ✓M = 399 cm ✓A = 3,99 m ✓C	1M using the scale 1A actual width 1C conversion (3)	12.3.3 12.3.2												
4.3.1	<p style="text-align: center;">NUMBER OF COPIES MADE</p> <table border="1" style="margin-top: 10px;"> <caption>Data for NUMBER OF COPIES MADE</caption> <thead> <tr> <th>Day of the week</th> <th>Number of copies</th> </tr> </thead> <tbody> <tr> <td>Mon</td> <td>350</td> </tr> <tr> <td>Tue</td> <td>580</td> </tr> <tr> <td>Wed</td> <td>280</td> </tr> <tr> <td>Thu</td> <td>320</td> </tr> <tr> <td>Fri</td> <td>300</td> </tr> </tbody> </table>	Day of the week	Number of copies	Mon	350	Tue	580	Wed	280	Thu	320	Fri	300	<p>5A mark for each bar correctly plotted</p> <p>1A correct graph</p> <p style="text-align: right;">(6)</p>	12.4.2
Day of the week	Number of copies														
Mon	350														
Tue	580														
Wed	280														
Thu	320														
Fri	300														
4.3.2	Wednesday ✓A	1A solution (1)	12.4.4												

QUESTION 5 [18 MARKS]			
Ques	Solution	Explanation	AS
5.1.1 a	$\text{Volume} = 3,14 \times (0,998 \text{ m})^2 \times 2,498 \text{ m} \quad \checkmark \text{SF}$ $= 7,81237\dots \text{m}^3$ $\approx 7,812 \text{ m}^3 \quad \checkmark \text{CA}$	1A value of radius 1SF substitution into formula 1CA simplification (3)	12.3.1
5.1.1 b	$\text{Height} = \frac{80}{100} \times 2,498 \text{ m} \quad \checkmark \text{M} \quad \text{OR} \quad 0,80 \times 2,498 \text{ m} \quad \checkmark \text{M}$ $= 1,9984 \text{ m} \quad \checkmark \text{CA}$ $\approx 1,998 \text{ m} \quad \checkmark \text{CA}$	1M calculating % 1CA solution (2)	12.1.1
5.1.2	Surface area of the tank $= 3,14 \times 1 \text{ m} \times (2 \times 2,5 \text{ m} + 1 \text{ m}) \quad \checkmark \text{A}$ $= 3,14 \text{ m} \times 6 \text{ m} \quad \checkmark \text{S}$ $= 18,84 \text{ m}^2 \quad \checkmark \text{CA} \quad \checkmark \text{A}$	1A substituting height 1A substituting radius 1S simplification 1CA answer 1A correct unit (5)	12.3.1
5.1.3	5 mm in 1 minute, so average rate = 5 mm/min $\text{Time taken} = \frac{1\,200 \text{ mm}}{5 \text{ mm/min}} \quad \checkmark \text{SF} \quad \text{OR} \quad \frac{1\,200 \text{ mm}}{5 \times 60 \text{ mm/hour}} \quad \checkmark \text{SF}$ $= 240 \text{ min} \quad \checkmark \text{CA}$ $= 4 \text{ hours} \quad \checkmark \text{C}$	1SF substituting 1CA solution 1 C conversion (3)	12.1.1 12.2.1 12.3.2
5.2.1	$7,5 \times A = 30 \quad \checkmark \text{M}$ $A = \frac{30}{7,5} \text{ workers}$ $= 4 \text{ workers} \quad \checkmark \text{CA}$ $B \times 8 = 30 \quad \checkmark \text{M}$ $B = \frac{30}{8} \text{ hours}$ $= 3,75 \text{ hours} \quad \checkmark \text{CA}$	1M multiplying/dividing 1CA simplification 1M multiplying/dividing 1CA simplification (4)	12.2.1
5.2.2	Inverse proportion OR indirect proportion $\checkmark \text{A}$	1A answer (1)	12.2.1

QUESTION 6 [21 MARKS]			
Ques	Solution	Explanation	AS
6.1.1	2 tanks = 2×26 gallons = 52 gallons ✓A	1A solution (1)	12.1.1
6.1.2	16 gallons ✓✓A (accept values more than 15 but less than 17,5)	2A reading value (2)	12.3.3
6.1.3	3 gallons ✓✓A (accept any value from 3 to 5)	2A reading value (2)	12.3.3
6.1.4	18 gallons = $18 \times 4,546$ litres = 81,83 litres ✓A	1M multiplying by conversion factor 1A solution (2)	12.3.2
6.1.5	Cost = 15,76 litres \times R9,92 per litre ✓M = R156,34 ✓A	1M multiplying 1A solution (2)	12.1.1
6.1.6	Percentage decrease = $\frac{0,86}{9,92} \times 100\%$ ✓F ✓SF = 8,66935.. % $\approx 8,67\%$ ✓A	1F correct formula 1SF substitution 1A solution (3)	12.1.1
6.2.1	B 2 or 2 B ✓✓A	2A correct grid reference (2)	12.3.4
6.2.2	Karoo National Park ✓A Bontebok National Park ✓A	2A for two names (2)	12.3.4
6.2.3	North West ✓✓A	2 A direction (2)	12.3.4
6.2.4	Average speed = $\frac{153 \text{ km}}{\frac{1}{2} \text{ hour}}$ ✓SF = 306 km per hour ✓CA	1SF substitution 1M dividing by $\frac{1}{2}$ 1CA solution (3)	12.2.1 12.3.2