



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

MATHEMATICAL LITERACY P1

FEBRUARY/MARCH 2013

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 13 pages.

QUESTION 1 [28 MARKS]			
Ques	Solution	Explanation	AS
1.1.1	$\frac{3}{4} \times (1,764 + 2,346) - \sqrt{1,44 - 0,95}$ $= \frac{3}{4} \times 4,11 - 0,7 \quad \checkmark S$ $= 3,0825 - 0,7$ $= 2,3825 \text{ or } 2,38 \quad \checkmark CA$	<p>1S simplification</p> <p>1CA simplification</p> <div style="border: 1px solid black; padding: 2px; display: inline-block;"> Answer only – FULL MARKS </div> <p style="text-align: right;">(2)</p>	12.1.1 L1
1.1.2	$6,25\% = \frac{6,25}{100} \quad \checkmark M$ $= \frac{625}{10000}$ $= \frac{1}{16} \quad \checkmark A$	<p>1M writing percentage as a fraction</p> <p>1A simplification</p> <div style="border: 1px solid black; padding: 2px; display: inline-block;"> Answer only – FULL MARKS </div> <p style="text-align: right;">(2)</p>	12.1.1 L1
1.1.3	$1\,260 \text{ seconds} = \frac{1260}{60 \times 60} \text{ hours} \quad \checkmark M$ $= \frac{7}{20} \text{ hours} \quad \text{OR } 0,35 \text{ hours} \quad \checkmark A$	<p>1M dividing by 3 600</p> <p>1A simplification</p> <div style="border: 1px solid black; padding: 2px; display: inline-block;"> Answer only – FULL MARKS </div> <p style="text-align: right;">(2)</p>	12.3.2 L1 (1) L2 (1)
1.1.4	$\text{Price per gram} = \frac{R9,96}{200} \quad \checkmark M$ $= R0,0498$ $\approx R0,05 \quad \text{OR } 5c \quad \checkmark A$	<p>1M dividing by 200 g</p> <p>1A simplification</p> <div style="border: 1px solid black; padding: 2px; display: inline-block;"> Answer only – FULL MARKS </div> <p style="text-align: right;">(2)</p>	12.1.3 L1
1.1.5	$\text{Breadth} = \frac{150}{2} \text{ m} - 50 \text{ m} \quad \checkmark SF$ $= 25 \text{ m} \quad \checkmark CA$	<p>1SF substitution</p> <p>1CA simplification</p> <div style="border: 1px solid black; padding: 2px; display: inline-block;"> Answer only – FULL MARKS </div> <p style="text-align: right;">(2)</p>	12.3.1 L1

Ques	Solution	Explanation	AS
1.2.1	$\frac{3}{4} \text{ cup} = \frac{3}{4} \times 250 \text{ ml} \quad \checkmark M$ $= 187,5 \text{ ml} \quad \checkmark A$	1M multiplying 1A simplification Answer only – FULL MARKS (2)	12.3.2 12.1.1 L1
1.2.2	$1 \text{ ounce} = \frac{480 \text{ g}}{16} = 30 \text{ g} \quad \checkmark C$ $\therefore 5 \text{ ounces} = 5 \times 30 \text{ g}$ $= 150 \text{ g} \quad \checkmark CA$	1C converting 1CA simplification (2)	12.3.2 L2
1.2.3	$\text{Temperature in } ^\circ\text{C} = \frac{^\circ\text{F} - 32^\circ}{1,8}$ $= \frac{360^\circ\text{F} - 32^\circ}{1,8} \quad \checkmark SF$ $= 182,222... \quad \checkmark A$ $\approx 180^\circ\text{C} \quad \checkmark R$	1SF substitution 1A simplification 1R rounding off Answer only – FULL MARKS (3)	12.2.1 L1(1) L2(2)
1.2.4	$\text{Amount of cake flour} = 4 \times \frac{1}{2} \times 480 \text{ g} \quad \checkmark M \quad \checkmark C$ $= 960 \text{ g} \quad \checkmark CA$	1M multiplying by 4 1C converting to grams 1CA simplification (3)	12.1.1 12.3.2 L1 (1) L2 (2)
1.3.1	13 % $\checkmark\checkmark$ RG	2RG reading from graph (2)	12.4.4 L2
1.3.2	Switzerland $\checkmark\checkmark$ RG	2RG reading from graph (2)	12.4.4 L2
1.3.3	Egypt $\checkmark\checkmark$ RG	2RG reading from graph (2)	12.4.4 L2
1.3.4	South Africa $\checkmark\checkmark$ RG	2RG reading from graph (2)	12.4.4 L2
			[28]

QUESTION 2 [29 MARKS]			
Ques	Solution	Explanation	AS
2.1.1	Kenya ✓RT	1RT reading from table (1)	12.4.4 L1
2.1.2	Ghanaian cedi ✓✓RT	1RT reading from table (2)	12.1.1 L2
2.1.3	25 976,87 Zambian kwacha = 25 976,87 × US\$ 0,000189 ^{✓M} = US\$ 4,91 ✓CA	1M multiplying by correct rate 1CA simplification Answer only – FULL MARKS (2)	12.1.1 L2
2.1.4	1 345 cedi = 1 345 × R4,41000 ✓M = R5 931,45 ✓CA	1M multiplying by correct rate 1CA simplification Answer only – FULL MARKS (2)	12.1.1 L2
2.2.1	Average = $\frac{1\,760}{640}$ shoot days ✓M = 2,75 shoot days ✓CA	1M finding average 1CA simplification Answer only – FULL MARKS (2)	12.4.3 L2
2.2.2	Total cost = 219 × R1 349 531 ✓M = R295 547 289 ✓A	1M multiplying by 219 1A simplification Answer only – FULL MARKS (2)	12.1.1 L1
2.2.3	640 – 219 ✓M = 421 ✓A	1M subtracting 1A simplification Answer only – FULL MARKS (2)	12.1.1 L1

Ques	Solution	Explanation	AS
2.2.4	Hiring cost = 16% of R1 349 531 ✓M $= \frac{16}{100} \times R1\ 349\ 531$ $= R215\ 924,96 \quad \checkmark CA$	1M multiplying by 16% 1CA simplification Answer only – FULL MARKS (2)	12.1.1 L1
2.2.5	Average cost in 2011 = 40% more than average cost in 2005 $= 140\% \times \text{average cost in 2005} \quad \checkmark M$ Average cost in 2005 = $\frac{R1\ 349\ 531}{\left(\frac{140}{100}\right)} \quad \checkmark M$ $= R963\ 950,71 \quad \checkmark CA$ <p style="text-align: center;">OR</p> Average cost = $R1\ 349\ 531 \times \frac{100}{140} \quad \checkmark M \quad \checkmark M$ $= R963\ 950,71 \quad \checkmark CA$	1M multiplying by 140% 1M dividing by percentage 1CA simplification <p style="text-align: center;">OR</p> 1M dividing 1M 140% 1CA simplification Answer only – FULL MARKS (3)	12.1.1 L2
2.3.1	Radius = 72 cm ✓A	1A answer (1)	12.3.1 L1
2.3.2	$k = \frac{(230-144)\checkmark M}{2 \quad \checkmark M}$ $= \frac{86}{2}$ $= 43 \text{ cm} \quad \checkmark CA$	1M subtraction of distance 1M dividing by 2 1CA simplification Answer only – FULL MARKS (3)	12.3.1 L2

Ques	Solution	Explanation	AS
2.3.3	Circumference = $3,14 \times 144 \text{ cm}$ ✓SF $= 452,16 \text{ cm}$ ✓CA ✓A	1SF substitution 1CA solution 1A unit <div style="border: 1px solid black; padding: 2px; display: inline-block;"> Answer only – FULL MARKS </div> (3)	12.3.1 L1
2.3.4	Area of wall = $(230)^2 - 3,14 \times \left(\frac{144}{2}\right)^2$ ✓SF $\checkmark S$ $= 52\,900 - 3,14 \times 5\,184$ $= 36\,622,24 \text{ cm}^2$ ✓CA ✓A	1SF substituting diameter 1S simplification 1CA solution 1A correct units <div style="border: 1px solid black; padding: 2px; display: inline-block;"> Answer only – FULL MARKS </div> (4)	12.3.1 L1 (3) L2 (1)
			[29]

QUESTION 3 [23 MARKS]			
Ques	Solution	Explanation	AS
3.1.1	Cost for the first four weeks (in rand) = $140 + (3 \times 40)$ ✓SF = 260 ✓CA	1SF substitution 1CA simplification (2)	12.2.1 L1
3.1.2	Cost for the first four weeks (in rand) = $500 + (3 \times 40)$ ✓SF = 620 ✓CA	1SF substitution 1CA simplification (2)	12.2.1 L1
3.1.3(a)	$A = R140 + R260$ ✓SF $= R400$ ✓CA OR $A = R400$ ✓✓RG $920 = 400 + B \times 40$ ✓SF $520 = B \times 40$ $13 = B$ ✓CA OR $500 + 40 \times (B - 1) = 980$ ✓SF $40 \times (B - 1) = 480$ $B - 1 = 12$ $B = 13$ ✓CA OR $B = 13$ ✓✓RG OR $140; 400; 660; 920; 1\ 180; 1\ 440; 1\ 700$ ✓A So, $B = 1 + 3 \times 4$ $= 13$ ✓CA	1SF substitution 1CA value of A OR 2RG reading from graph 1SF substitution 1CA value of B OR 2RG reading B from graph OR 1A list of values 1CA value of B (4)	12.2.3 L1 (4)
3.1.3(b)	Hair extensions ✓✓ RT	2RT conclusion (2)	12.2.3 L1
3.1.3(c)	$R2\ 480 - R2\ 400$ ✓RT = $R80$ ✓A	1RT correct values 1A simplification (2)	12.2.3 L1

Ques	Solution	Explanation	AS																														
3.1.3(d)	<p style="text-align: center;">COMPARISON OF ACCUMULATED COSTS</p> <table border="1" style="display: none;"> <caption>Data points from the graph</caption> <thead> <tr> <th>Number of weeks</th> <th>Hair extensions (Cost in rand)</th> <th>Hair relaxing (Cost in rand)</th> </tr> </thead> <tbody> <tr><td>0</td><td>500</td><td>150</td></tr> <tr><td>5</td><td>650</td><td>350</td></tr> <tr><td>10</td><td>900</td><td>600</td></tr> <tr><td>15</td><td>1100</td><td>900</td></tr> <tr><td>20</td><td>1400</td><td>1200</td></tr> <tr><td>25</td><td>1900</td><td>1700</td></tr> <tr><td>30</td><td>2100</td><td>2000</td></tr> <tr><td>35</td><td>2300</td><td>2300</td></tr> <tr><td>37</td><td>2500</td><td>2500</td></tr> </tbody> </table>	Number of weeks	Hair extensions (Cost in rand)	Hair relaxing (Cost in rand)	0	500	150	5	650	350	10	900	600	15	1100	900	20	1400	1200	25	1900	1700	30	2100	2000	35	2300	2300	37	2500	2500	<p>1A (1 ; 500) 1A (25 ; 1 920) 1A (29 ; 2 080) 1A (37 ; 2 480) 1A joining the points 1A labelling the graph</p>	<p>12.2.2 L1 (3) L2 (3)</p>
Number of weeks	Hair extensions (Cost in rand)	Hair relaxing (Cost in rand)																															
0	500	150																															
5	650	350																															
10	900	600																															
15	1100	900																															
20	1400	1200																															
25	1900	1700																															
30	2100	2000																															
35	2300	2300																															
37	2500	2500																															
3.2.1	$\text{Height} = \frac{500}{3,14 \times 4,5^2} \checkmark \text{SF}$ $= 7,86 \text{ cm} \checkmark \text{A}$	<p>1SF substitution 1A simplification 1A units</p>	<p>12.3.1 L1 (3)</p>																														
3.2.2	$\text{Percentage increase} = \frac{600 \text{ ml} - 500 \text{ ml}}{500 \text{ ml}} \times 100\% \checkmark \text{SF}$ $= 20\% \checkmark \text{A}$	<p>1SF substitution 1A simplification</p>	<p>12.1.1 L1</p>																														
			<p>[23]</p>																														

QUESTION 4 [25 MARKS]			
Ques	Solution	Explanation	AS
4.1.1	Houses built in 2010 = 100% – (16+15+17+16+18)% ✓M = 100% – 82% = 18% ✓A	1M concept of 100% pie 1A simplification (2)	12.4.2 L2
4.1.2	2006 ✓A	1A solution (1)	12.4.4 L1
4.1.3	2008 ✓A	1A solution (1)	12.4.4 L1
4.1.4	Number of houses built in 2005 = $\frac{16}{100} \times 909\,275$ ✓M = 145 484 ✓CA	1RG correct values 1M concept of % 1CA simplification (3)	12.4.4 12.1.1 L1 (2) L2 (1)
4.2.1	Weekly wages per employee = 5 × 8 × R40 ✓M = R1 600 ✓A	1M concept 1A simplification (2)	12.2.1 L1
4.2.2(a)	overtime rate : normal rate = R50 : R40 = 50 : 40 ✓M = 5 : 4 ✓A	1M correct values used 1A simplifying (2)	12.1.1 L1
4.2.2(b)	Number of overtime hours = $\frac{R350}{R50 \text{ per hour}}$ ✓M = 7 hours ✓A	1M concept 1A simplification (2)	12.1.1 L1
4.2.3	Number of overtime hours = $\frac{1\,920 - (38 \times 40)}{50}$ ✓SF = $\frac{400}{50}$ ✓S = 8 ✓A	1SF substitution 1S simplification 1A simplification (3)	12.2.1 L2

Ques	Solution	Explanation	AS
4.3.1(a)	Soccer and volleyball ✓A	1A solution (1)	12.3.3 L1
4.3.1(b)	2 ✓A	1A solution (1)	12.3.3 L1
4.3.1(c)	Merry-go-round ✓✓A	2A solution (2)	12.3.4 L2
4.3.2	1 cm on map represents 250 cm in real life. 15 m = 1 500 cm ✓C $1\ 500\ \text{cm in real life} = \frac{1\ 500}{250}\ \text{cm on map}$ $= 6\ \text{cm on the map} \checkmark\text{CA}$	1C conversion 1CA simplification (2)	12.3.3 L2
4.3.3	Volume = 2,5 m × 1,5 m × 0,4 m ✓SF $= 1,5\ \text{m}^3 \checkmark\text{CA} \checkmark\text{A}$	1SF substitution in formula 1CA simplification 1A unit (3)	12.3.1 L1
			[25]

QUESTION 5 [23 MARKS]			
Ques	Solution	Explanation	AS
5.1.1	$15 + 16 = 31$ ✓✓A	2A solution (2)	12.4.4 L1
5.1.2	1 (one) ✓A	1A solution (1)	12.4.4 L1
5.1.3	Range = (180 – 30) minutes ✓M = 150 minutes ✓A	1M concept of range 1A simplification (2)	12.4.3 L2
5.1.4	120 minutes ✓✓A	2A simplification (2)	12.4.3 L1
5.1.5	Median = 95 minutes ✓A✓A	2A solution (2)	12.4.3 L1
5.1.6	Mean = $\frac{0 + 30 + 30 + 30 + 40 + 45 + 45 + 50 + 60 + 60 + 60 + 60 + 60 + 150 + 150 + 180}{16}$ ✓M = $\frac{1\ 050}{16}$ = 65,63 minutes ✓CA	1M adding 1M dividing by 16 1CA simplification (3)	12.4.3 L2
5.1.7	Probability (a learner watching TV for 45 minutes) = $\frac{2}{16}$ ✓A = $\frac{1}{8}$ ✓A OR $\frac{1}{8}$ ✓A OR 12,5 % ✓✓A	1A numerator 1A denominator (2)	12.4.5 L2

Ques	Solution	Explanation	AS
5.2.1	36 minutes ✓RG	1RG reading from graph (1)	12.2.3 L1
5.2.2	Total distance = 2 km away + 2 km back ✓RG = 4 km ✓A	1RG reading from graph 1A simplification (2)	12.2.3 L2
5.2.3	1,6 km ✓✓RG	2RG reading from graph (2)	12.2.3 L1
5.2.4	Twice/two times ✓✓RG	2RG reading from graph (2)	12.2.3 L1
5.2.5	✓RG At 6 minutes and after 26 minutes ✓RG	2RG reading from graph (2)	12.2.3 L2
			[23]

QUESTION 6 [22 MARKS]			
Ques	Solution	Explanation	AS
6.1.1	11:45 ✓ A	1A correct time (1)	12.4.4 L1
6.1.2	✓ A Cape Argus and Pick'n Pay ✓ A	2A correct answer (2)	12.4.4 L1
6.1.3	110 km – 52,2 km ✓M = 57,8 km ✓CA	1M subtraction 1CA simplification (2)	12.3.1 L1
6.1.4	Noordhoek ✓✓A	2A correct answer (2)	12.3.4 L2
6.1.5	Distance = 90,7 km – 31,9 km ✓M = 58,8 km ✓CA	1M subtracting correct values 1CA answer (2)	12.3.1 L1
6.1.6	Time = $\frac{110 \text{ km}}{15,9 \text{ km/h}}$ ✓SF t ≈ 6,918... hrs ≈ 6,92 hrs ✓CA	1SF substitution 1CA simplification (2)	12.2.1 L1
6.2.1	2:29:59 2:31:57 2:34:28 2:36:17 2:37:50 2:39:35 2:39:55 ✓✓A	2A solution (2)	12.1.1 L1
6.2.2	2 hours + 36 minutes and 17 seconds = 2 × 3 600 seconds + 36 × 60 seconds + 17 seconds ✓C = 9 377 seconds ✓CA	1C converting 1CA simplification (2)	12.3.2 L2
6.3.1	Minimum volume = 7 × 0,5 l ✓M = 3,5 l ✓A	1M rate/proportion 1A simplification (2)	12.1.1 L1
6.3.2	Surface area = 2 × 3,14 × 3,25 cm × 15,1 cm ✓SF = 308,191 cm ² ≈ 308,19 cm ² ✓A	1SF substitution 1A simplification (2)	12.3.1 L2
6.3.3	Number of 750 ml bottles = $\frac{4200}{750}$ ✓M = 5,6 ✓S ∴ He will need 6 bottles of water. ✓R	1M dividing 1S simplification 1R rounding (3)	12.1.1 12.1.2 L1(2) L2(1)
			[22]

TOTAL: 150