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	$\frac{3}{4} \times (1,764 + 2,346) - \sqrt{1,44 - 0,95}$ $= \frac{3}{4} \times 4,11 - 0,7$ ✓S $= 3,0825 - 0,7$ $= 2,3825$ or $2,38$ ✓CA	1S simplification 1CA simplification **Answer only – FULL MARKS** (2)	12.1.1 L1
1.1.2	$6,25\% = \frac{6,25}{100}$ ✓M $= \frac{625}{10\,000}$ $= \frac{1}{16}$ ✓A	1M writing percentage as a fraction 1A simplification **Answer only – FULL MARKS** (2)	12.1.1 L1
1.1.3	$1\,260$ seconds $= \frac{1260}{60 \times 60}$ hours ✓M $= \frac{7}{20}$ hours **OR** $0,35$ hours ✓A	1M dividing by 3 600 1A simplification **Answer only – FULL MARKS** (2)	12.3.2 L1 (1) L2 (1)
1.1.4	Price per gram $= \frac{R9,96}{200}$ ✓M $= R0,0498$ $\approx R0,05$ **OR** 5c ✓A	1M dividing by 200 g 1A simplification **Answer only – FULL MARKS** (2)	12.1.3 L1
1.1.5	Breadth $= \frac{150}{2}$ m $- 50$ m ✓SF $= 25$ m ✓CA	1SF substitution 1CA simplification **Answer only – FULL MARKS** (2)	12.3.1 L1

Ques	Solution	Explanation	AS
1.2.1	$\dfrac{3}{4}$ cup = $\dfrac{3}{4}$ × 250 mℓ ✓M = 187,5 mℓ ✓A	1M multiplying 1A simplification **Answer only – FULL MARKS** (2)	12.3.2 12.1.1 L1
1.2.2	1 ounce = $\dfrac{480\ g}{16}$ = 30 g ✓C ∴ 5 ounces = 5 × 30 g = 150 g ✓CA	1C converting 1CA simplification (2)	12.3.2 L2

1.2.3	Temperature in °C = $\dfrac{°F - 32°}{1,8}$
	                 = $\dfrac{360°F - 32°}{1,8}$ ✓SF
	          = 182,222.. ✓A
	      ≈ 180 °C ✓R
		1SF substitution
		
		 1A simplification
		 1R rounding off
		 Answer only – FULL MARKS
		 (3)
			12.2.1
			 L1(1)
			 L2(2)

1.2.4	✓M Amount of cake flour = 4 × $\dfrac{1}{2}$ × 480 g ✓C = 960 g ✓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 % ✓✓ RG	2RG reading from graph (2)	12.4.4 L2
1.3.2	Switzerland ✓✓RG	2RG reading from graph (2)	12.4.4 L2
1.3.3	Egypt ✓✓RG	2RG reading from graph (2)	12.4.4 L2
1.3.4	South Africa ✓✓RG	2RG reading from graph (2)	12.4.4 L2
			[28]
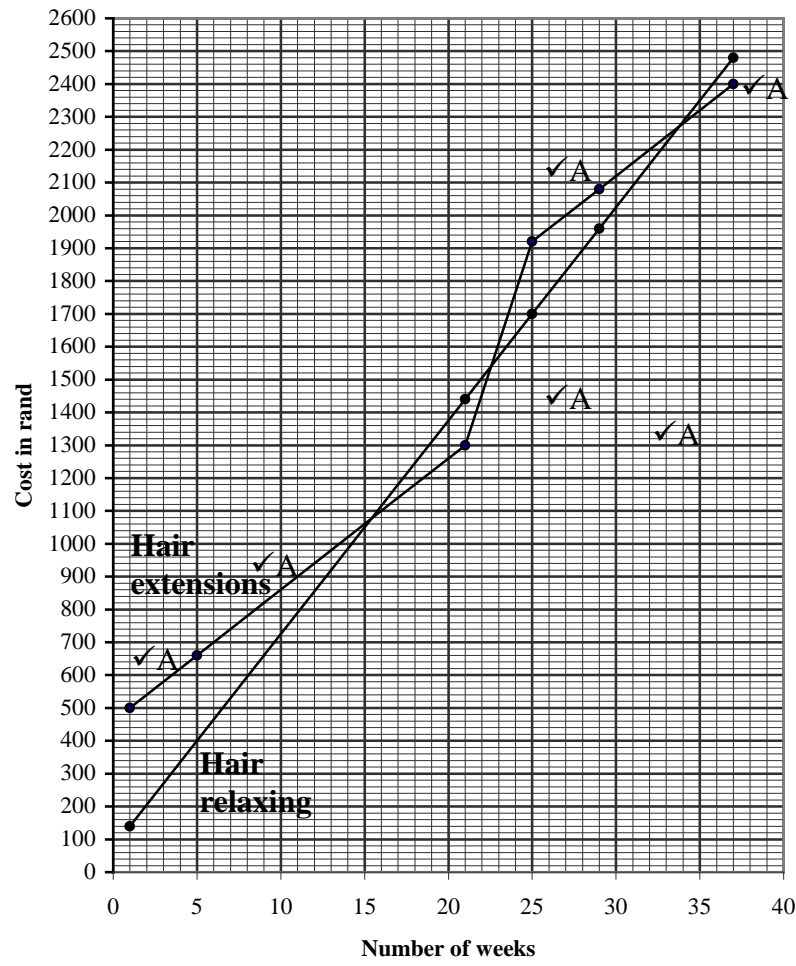
QUESTION 2 [29 MARKS]

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 = $\dfrac{1\ 760}{640}$ 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 $= \dfrac{16}{100} \times \text{R1 349 531}$ = R215 924,96 ✓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% × average cost in 2005 ✓M
	Average cost in 2005 = $\dfrac{\text{R1 349 531}}{\left(\dfrac{140}{100}\right)}$ ✓M
	
	    = R963 950,71 ✓CA
	
	OR
	
	Average cost = R1 349 531 × $\dfrac{100}{140}$ ✓M ✓M
	    = R963 950,71 ✓CA
		1M multiplying by 140%
		
		1M dividing by percentage
		
		1CA simplification
		
		OR
		
		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 = $\dfrac{(230-144)\text{✓M}}{2 \quad \text{✓M}}$ = $\dfrac{86}{2}$ = 43 cm ✓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 $= 3,14 \times 144$ cm ✓SF $= 452,16$ cm ✓CA ✓A	1SF substitution 1CA solution 1A unit **Answer only – FULL MARKS** (3)	12.3.1 L1
2.3.4	Area of wall $= (230)^2 - 3,14 \times \left(\dfrac{144}{2}\right)^2$ ✓SF ✓S $= 52\ 900 - 3,14 \times 5\ 184$ $= 36\ 622,24$ cm^2 ✓CA ✓A	1SF substituting diameter 1S simplification 1CA solution 1A correct units **Answer only – FULL MARKS** (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 $\quad\quad\quad\quad\quad A = R400$ ✓✓RG $\quad = R400$ ✓CA $\quad\quad$ **OR** $920 = 400 + B \times 40$ ✓SF $\quad 500 + 40 \times (B-1) = 980$ ✓SF $520 = B \times 40 \quad\quad\quad\quad 40 \times (B-1) = 480$ $13 = B$ ✓CA $\quad$ **OR** $\quad\quad\quad B - 1 = 12$ $\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad B = 13$ ✓CA **OR** $B = 13$ ✓✓RG **OR** 140; 400; 660; 920; 1 180; 1 440; 1 700 ✓A So, $B = 1 + 3 \times 4$ $\quad\quad = 13$ ✓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

       Please turn over

Ques	Solution	Explanation	AS
3.1.3(d)	**COMPARISON OF ACCUMULATED COSTS** (6)	1A (1 ; 500) 1A (25 ; 1 920) 1A (29 ; 2 080) 1A (37 ; 2 480) 1A joining the points 1A labelling the graph	12.2.2 L1 (3) L2 (3)
3.2.1	Height $= \dfrac{500}{3,14 \times 4,5^2}$ ✓SF $= 7,86$ cm ✓A ✓A	1SF substitution 1A simplification 1A units (3)	12.3.1 L1 (3)
3.2.2	Percentage increase $= \dfrac{600\,m\ell - 500\,m\ell}{500\,m\ell} \times 100\%$ ✓SF $= 20\%$ ✓A	1SF substitution 1A simplification (2)	12.1.1 L1
			[23]
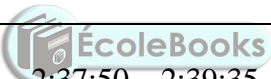
QUESTION 4 [25 MARKS]			
Ques	**Solution**	**Explanation**	**AS**
4.1.1	Houses built in 2010 $= 100\% - (16+15+17+16+18)\%$ ✓M $= 100\% - 82\%$ $= 18\%$ ✓A	1M concept of 100% pie 1A simplification (2)	12.4.2 L2
4.1.2	2006 ✓A	1A solution (1)	12.4.4 L1
4.1.3	2008 ✓A	1A solution (1)	12.4.4 L1
4.1.4	Number of houses built in 2005 $= \dfrac{\overset{\text{✓RG}}{16}}{100} \times 909\,275$ ✓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 $= 5 \times 8 \times R40$ ✓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 $= \dfrac{R350}{R50\,\text{per hour}}$ ✓M $= 7$ hours ✓A	1M concept 1A simplification (2)	12.1.1 L1
4.2.3	Number of overtime hours $= \dfrac{1\,920 - (38 \times 40)}{50}$ ✓SF $= \dfrac{400}{50}$ ✓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 cm in real life = $\dfrac{1\ 500}{250}$ cm on map $\qquad\qquad\qquad = 6$ cm on the map ✓CA	1C conversion 1CA simplification (2)	12.3.3 L2
4.3.3	Volume $= 2{,}5$ m $\times$ $1{,}5$ m $\times 0{,}4$ m ✓SF $\qquad = 1{,}5$ m^3 ✓CA ✓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 $$= \frac{0+30+30+30+40+45+45+50+60+60+60+60+60+150+150+180}{16} \; ✓M ✓M$$ $$= \frac{1\,050}{16}$$ $= 65{,}63$ 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) $= \dfrac{2}{16}$ ✓A ✓A **OR** $\dfrac{1}{8}$ ✓A ✓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 = $\dfrac{110\,\text{km}}{15,9\,\text{km/h}}$ ✓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 cm² ≈ 308,19 cm² ✓A	1SF substitution 1A simplification (2)	12.3.1 L2
6.3.3	Number of 750 mℓ bottles = $\dfrac{4\,200}{750}$ ✓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**