basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

MATHEMATICAL LITERACY P1

FEBRUARY/MARCH 2011

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 14 pages.

QUESTION 1 [33 MARKS]			
Ques	**Explanation**	**Mark Allocation**	**AS**
1.1.1	$148\% = \frac{148}{100}$ ✓M $= \frac{37}{25}$ **OR** $1\frac{12}{25}$ ✓A	1M concept 1A simplifying (2)	12.1.1
1.1.2	1,256 cm = 1,256 × 10 mm = 12,56 mm ✓A	1A conversion (1)	12.3.2
1.1.3	$1\frac{1}{2}(1{,}26 + 32{,}62) - \sqrt{2{,}25}$ ✓A $= \frac{3}{2} \times 33{,}88 - 1{,}5$ ✓A = 50,82 – 1,5 = 49,32 ✓A	1A simplifying brackets 1A square root 1A simplifying (3)	12.1.1
1.1.4	150 minutes = $\frac{150}{60}$ hours ✓M = $2\frac{1}{2}$ hours ✓A	1M dividing 1A simplifying (2)	12.1.1
1.1.5	$\frac{\text{R}12{,}99}{12}$ ✓M = R1,08 ✓A	1M division by 12 1A simplifying (2)	12.1.1
1.1.6	R1 = 1,6915 MXN ∴ ZAR 1 220 = 1 220 × 1,6915 MXN ✓M = 2 063, 63 MXN ✓A	1M multiplication 1A simplifying (2)	12.1.3
1.1.7	Growth (in cm) = $\frac{50}{10}$ ✓SF = 5 ✓A	1SF substituting t = 10 1A simplifying (2)	12.2.1

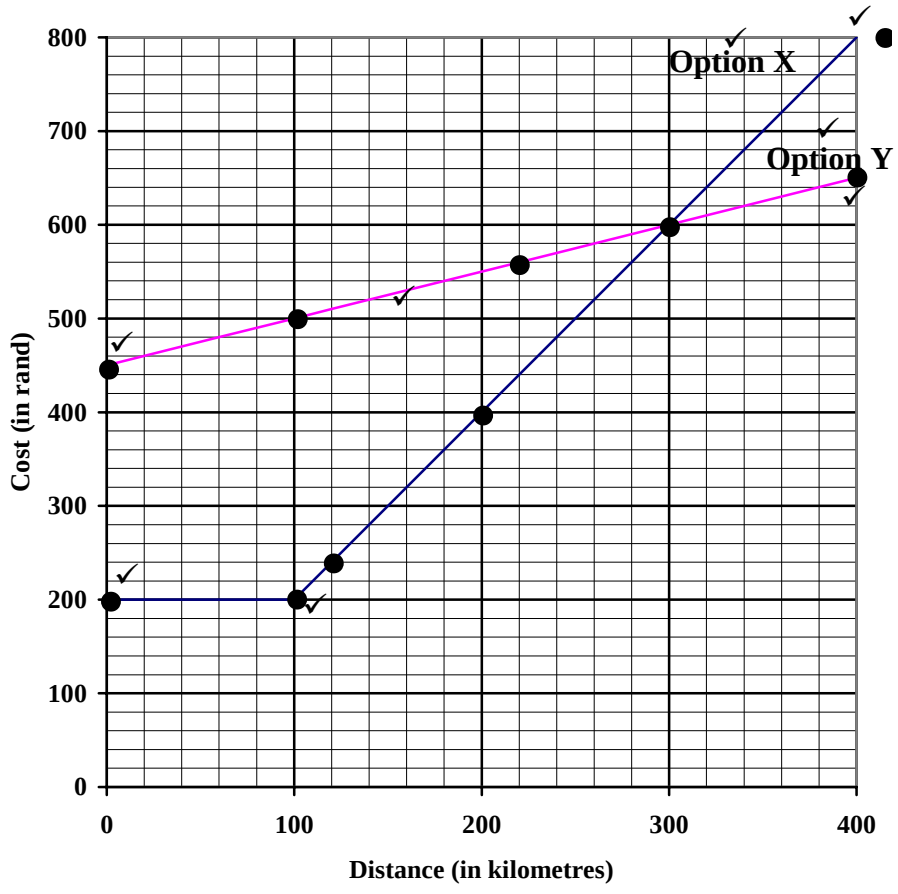
Ques	Explanation	Mark Allocation	AS
1.2.1	$7 - 5 = 2$ ✓M ✓A	1M subtraction 1A simplifying (2)	12.4.3
1.2.2	Modal age = 11 yrs ✓A	1A simplifying (1)	12.4.3
1.2.3	Mean = $\frac{1+2+3+3+4+10+11+11+11+12+15+16}{12}$ ✓M = $\frac{99}{12}$ ✓A = 8,25 years ✓A	1M finding the mean 1A correct values 1A simplifying (3)	12.4.3
1.2.4	P(10 years old) = $\frac{1}{12}$ ✓A ✓A	1A numerator 1A denominator (2)	12.4.5
1.3.1	Cocoa powder : sugar = 1 : 2 = 10 : 20 ✓A She would need 20 spoons of sugar ✓CA	1A proportion 1CA number of spoons (2)	12.1.1
1.3.2	Mass of milk powder = $\frac{3}{6} \times 900$ g ✓A ✓A = $\frac{1}{2} \times 900$ g = 450 g ✓CA	1A proportion 1A total number of parts 1CA mass of milk powder (3)	12.1.1
1.4.1	Cost of the call = R2,90 × 5 ✓M = R14,50 ✓A **OR** Cost of the call = R14,50 ✓✓RG	1M multiplying peak rate 1A cost of call 2RG cost of call (2)	12.2.3

Ques	Explanation	Mark Allocation	AS
1.4.2	Cost of the call = R1,90 × 5 ✓M = R9,50 ✓A **OR** Cost of a call = R9,50 ✓✓RG	1M multiply off-peak rate 1A cost of call 2RG cost of call (2)	12.2.3
1.4.3	Maximum time = 9 ÷ 2,9 ✓M = 3,1 minutes ✓A **OR** 3 minutes ✓✓RG	1M dividing by rate 1A time 2RG duration of call (2)	12.2.3

QUESTION 2 [29 MARKS]			
Ques	**Explanation**	**Mark Allocation**	**AS**
2.1.1	Administration coordinator Hotel coordinator ✓RT✓RT Data manager Accounts manager	2RT reading from table **OR** 1RT if only 2 are correct (2)	12.4.4
2.1.2	Total earnings = 4 × R22 000 ✓M = R88 000 ✓A	1 M finding total earnings 1A total earnings (2)	12.1.3 12.4.4
2.1.3	31 July 2010 ✓A ✓A	1A day 1A month (2)	12.3.1
2.1.4	Accounts manager : Administration coordinator ✓RT = 25 000 **:** 15 000 ✓RT = 5 **:** 3 ✓A	2 RT reading from table 1A simplified ratio (3)	12.1.1 12.4.4
2.2.1	Radius = 30 cm ✓A	1A radius (1)	12.3.1
2.2.2	Area of the mirror ✓SF ✓SF $= \frac{1}{2} \times 3{,}14 \times (60 \div 2)^2 + (60)^2$ ✓S ✓S = 1 413 cm^2 + 3 600 cm^2 = 5 013 cm^2 ✓CA	1SF substituting diameter 1SF substituting side 1S area of semi-circle 1S area of square 1CA area of mirror (5)	12.3.1
2.3.1	∴ US \$250 billion = US \$250 × 1 000 million ✓C = US \$250 000 million ✓A	1C conversion 1A answer in millions (2)	12.1.1

Ques	Explanation	Mark Allocation	AS
2.3.2	27% + 32% ✓M = 59% ✓A **OR** 100% – 41%✓M = 59% ✓A	1M adding 1A % not from services **OR** 1M subtracting 1A % not from services (2)	12.1.1
2.3.3	Services = 100% – 15% – 28%✓M = 57% ✓A	1M subtracting 1A % from services (2)	12.4.4 12.1.1
2.3.4	Industry = 27% × US$ 250 billion ✓RG ✓M = US$ 67,5 billion ✓A	1M using percentage 1RG reading from graph 1A % from industry (3)	12.4.4 12.1.1
2.3.5	% Difference = 32% – 15% ✓RG = 17 % ✓A	1M finding the difference 1A simplifying (2)	12.4.4 12.1.1
2.3.6	✓M Agriculture = 15% × US$ 1 000 000 billion✓RG = US$ 150 000 billion ✓A	1M using percentage 1RG reading from graph 1A amount from Agriculture (3)	12.4.4 12.1.1

QUESTION 3 [23 MARKS]

Ques	Explanation	Mark Allocation	AS
3.1.1	A = 450 + 160 × 0,5 ✓M = 450 + 80 = R530 ✓A	1M finding the cost 1A cost (2)	12.2.1
3.1.2	✓M B = 200 + (250 – 100) × 2 = 200 + 150 × 2 = 200 + 300 ✓S = R500 ✓CA	1M subtracting 1S simplification 1A cost (3)	12.2.1
3.2		**Option X** 1A point (0 ; 450) 1A point (400 ; 650) 1A correct straight line drawn 1A label **Option Y** 1A point (0 ; 200) 1A point (100 ; 200) 1A point (400; 800) 1A points joined correctly 1A label (9)	12.2.2
3.3.1	300 km ✓RT ✓RT	2RT reading from graph or table (2)	12.2.1
3.3.2	R600 ✓RT	1RT reading from graph or table (1)	12.2.3

Ques	Explanation	Mark Allocation	AS
3.4	Time = $\frac{180\,\text{km}}{100\,\text{km/h}}$ ✓SF = 1,8 hrs ✓A = 1 hr + 0,8 × 60 min = 1 hr 48 min ✓C ✓M	1SF substitution in formula 1A number of hours 1C converting to hr and min (3)	12.2.1 12.3.1
3.5	Litres of petrol = $\frac{258{,}24}{8{,}07}$ ✓SF = 32 ✓A	1M finding number of litres 1SF correct substitution 1A simplifying (3)	12.1.1

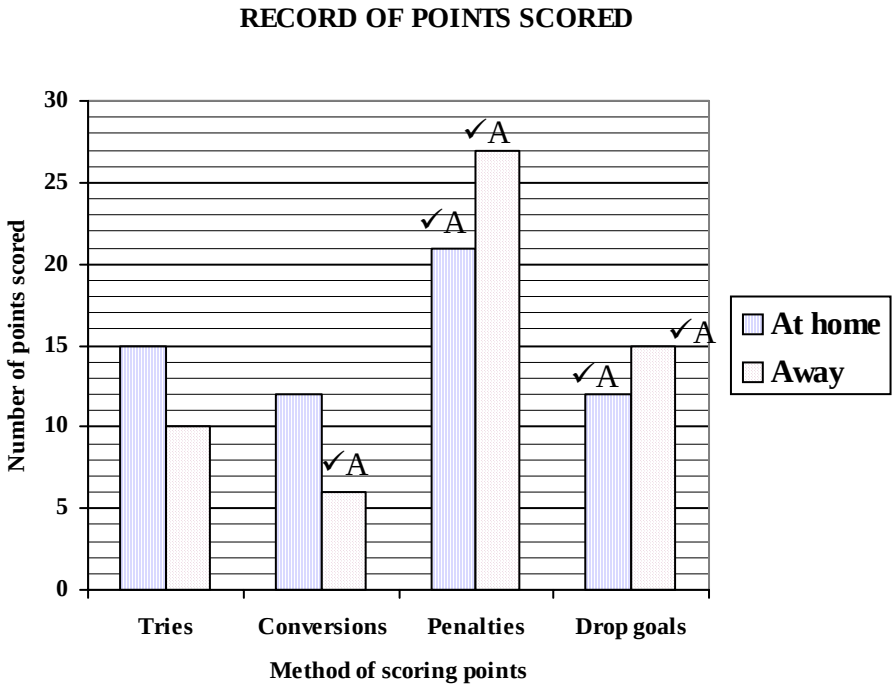
QUESTION 4 [21 MARKS]			
Ques	**Explanation**	**Mark Allocation**	**AS**
4.1.1	✓M ✓A P = 2 m + 8 m + 1 m + 3 m+ 3 m ✓A = 17 m	1M adding the 5 sides 1A calculating 3m 1A simplifying (3)	12.3.1
4.1.2	✓M A = (11 m× 3 m) – (8 m × 1 m)✓SF = 33 m^2 – 8 m^2 = 25 m^2✓CA ✓A **OR** ✓M ✓SF A = (3 m × 3 m) + (8 m × 2 m) = 9 m^2 + 16 m^2 = 25 m² ✓CA ✓A	1M finding area of patio 1SF substitution 1CA area of patio 1A correct unit **OR** 1M finding area of patio 1SF substitution 1CA area of patio 1A correct unit (4)	12.3.1
4.2.1 (a)	A = $\frac{60\text{ hours}}{2}$ ✓M = 30 hours ✓A	1M dividing 1A number of hours (2)	12.2.3
4.2.1 (b)	B × 15 = 60 B = $\frac{60}{15}$ ✓M = 4 workers ✓A	1M dividing 1A simplifying (2)	12.2.3
4.2.2	Indirect/Inverse proportion ✓A	1A type of proportion (1)	12.2.3
4.3.1	V = 3,14 ×(20 cm)^2×60 cm ✓SF = 75 360 cm^3 ✓A ✓A	1SF substitution in formula 1A volume 1A correct unit (3)	12.3.1

Ques	Explanation	Mark Allocation	AS
4.3.2	Lateral surface area of the pot $= 2 \times 3{,}14 \times 20 \times 80\ cm^2$ ✓SF $= 10\ 048\ cm^2$ ✓A	SF substitution in formula 1A surface area (2)	12.3.1
4.4	Costs = $(6 \times$ R45,50) + $(4 \times$ R19,99) ✓M ✓M = R273,00 + R79, 96 ✓S = R352,96 ✓CA	2M finding the costs 1S simplification 1CA amount paid (4)	12.1.1

QUESTION 5 [25 MARKS]			
Ques	**Explanation**	**Mark Allocation**	**AS**
5.1.1	21 000 ✓RT ✓RT	2RT reading from table (2)	12.4.4
5.1.2	93 400 + 57 500 +117 100 + 21 000 ✓M ✓RT = 289 000 people ✓A	1 RT reading from table 1 M addition 1A simplifying (3)	12.4.4 12.1.1
5.1.3	✓RT ✓RT Gauteng and KwaZulu-Natal	2RT reading from table (2)	12.4.4
5.1.4	✓RT ✓M ✓RT 117 100 – 56 400 = 60 700 people ✓A	2RT reading from table 1M subtracting 1A simplifying (4)	12.4.4 12.1.1
5.2.1	✓M Range = R7 250 – R4 200 = R3 050 ✓CA	1M concept 1CA simplifying (2)	12.4.3
5.2.2	Median = R4 650 ✓A ✓A	1A arranging data 1A median (2)	12.4.3
5.2.3	Average(mean) = ✓M $R\frac{5\,525+5\,500+5\,980+6\,250+6\,250+6\,250+6\,300+7\,800+8\,200+8\,900}{10}$ ✓A $=\frac{R\,66\,955}{10}$ = R6 695,50 ✓CA	1 M sum 1A dividing by 10 1CA mean salary (3)	12.4.3
5.2.4	✓A $\frac{3}{10}\times 100\%$ ✓M = 30 % ✓CA	1M salaries greater than maximum in Greytown 1M calculating % 1A simplifying (3)	12.4.4 12.1.1

Ques	Explanation	Mark Allocation	AS
5.3	$A = P(1 + i)^n$ ✓SF ✓A $= R6\ 350\ (1 + 0{,}058)^2$ $= R7\ 107{,}9614$ ✓CA $\approx R7\ 107{,}96$ ✓R	1A value of i 1SF substitution 1CA amount 1R rounding off to the nearest cent (4)	12.1.1 12.2.1

QUESTION 6 [19 MARKS]			
Ques	**Explanation**	**Mark Allocation**	**AS**
6.1.1	D2 or 2D ✓A	1A solution (1)	12.3.4
6.1.2	Maitland; Peet Avenue; Bastion; Yoxall ✓A ✓A	1A two streets correct 1A all streets correct (2)	12.3.4
6.1.3	From Luke's residence you turn right into St George's Street. ✓A At the first intersection, you turn left into President Brand Street. ✓A Continue with the road until you reach Zastron Street. Turn right into Zastron Street. ✓A Immediately after crossing Aliwal Street you will find the entrance on your left-hand side. ✓A **OR** From Luke's residence, turn left into St George's Street. ✓A At the intersection, turn right into Markgraaf Street. ✓A Proceed until you reach Zastron Street. Turn right into Zastron Street. ✓A Proceed until you cross Aliwal Street and the entrance is on the left hand side. ✓A **OR** Any other possible route.	1A turning into St George's Street 1A correct turn at first intersection from the residence 1A correct turn into Zastron Street 1A entry into the club **OR** 1A turning into St George's Street 1A turning into Markgraaf Street 1A turning into Zastron Street 1A entry into the club (4)	12.3.1
6.1.4	7 cm on map = 7 × 20 000 cm in real life = 140 000 cm ✓M $= \frac{140\ 000}{100}$ m = 1 400 m ✓A $= \frac{1\ 400}{1\ 000}$ km = 1,4 km ✓CA	1M multiplication 1A converting to m 1CA simplifying (3)	12.3.3 12.3.1
6.2.1	Final Score = (3 × 5) + (0 × 2) + (4 + 1) × 3 ✓SF ✓A = 15 + 0 + 5 × 3 ✓CA = 30 ✓CA	1SF substitution 1A correct values used 1CA simplification 1CA simplifying (4)	12.2.1

Ques	Explanation	Mark Allocation	AS
6.2.2		5A One for each bar (5)	12.4.2

TOTAL: 150