



# basic education

Department:  
Basic Education  
**REPUBLIC OF SOUTH AFRICA**

## NATIONAL SENIOR CERTIFICATE

**GRADE 12**

**MATHEMATICAL LITERACY P1**

**FEBRUARY/MARCH 2011**


**MEMORANDUM**

**MARKS: 150**

<b>SYMBOL</b>	<b>EXPLANATION</b>
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	$148\% = \frac{148}{100} \checkmark M$ $= \frac{37}{25} \text{ OR } 1 \frac{12}{25} \checkmark A$	1M concept 1A simplifying (2)	12.1.1
1.1.2	$1,256 \text{ cm} = 1,256 \times 10 \text{ mm}$ $= 12,56 \text{ mm} \checkmark A$	1A conversion (1)	12.3.2
1.1.3	$1 \frac{1}{2} (1,26 + 32,62) - \sqrt{2,25}$ $\checkmark A$ $= \frac{3}{2} \times 33,88 - 1,5 \checkmark A$ $= 50,82 - 1,5$ $= 49,32 \checkmark A$	1A simplifying brackets 1A square root 1A simplifying (3)	12.1.1
1.1.4	$150 \text{ minutes} = \frac{150}{60} \text{ hours} \checkmark M$ $= 2 \frac{1}{2} \text{ hours} \checkmark A$	1M dividing 1A simplifying (2)	12.1.1
1.1.5	$\frac{R12,99}{12} = R1,08 \checkmark M \checkmark A$	1M division by 12 1A simplifying (2)	12.1.1
1.1.6	$R1 = 1,6915 \text{ MXN}$ $\therefore \text{ZAR } 1\ 220 = 1\ 220 \times 1,6915 \text{ MXN} \checkmark M$ $= 2\ 063,63 \text{ MXN} \checkmark A$	1M multiplication 1A simplifying (2)	12.1.3
1.1.7	$\text{Growth (in cm)} = \frac{50}{10} \checkmark SF$ $= 5 \checkmark A$	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	$\text{Mean} = \frac{1+2+3+3+4+10+11+11+11+12+15+16}{12}$ $= \frac{99}{12}$ $= 8,25 \text{ years}$ ✓M ✓A ✓A	1M finding the mean  1A correct values  1A simplifying (3)	12.4.3
1.2.4	$P(10 \text{ years old}) = \frac{1}{12}$ ✓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	$\text{Mass of milk powder} = \frac{3}{6} \times 900 \text{ g}$ $= \frac{1}{2} \times 900 \text{ g}$ $= 450 \text{ g}$ ✓A ✓A ✓CA	1A proportion 1A total number of parts  1CA mass of milk powder (3)	12.1.1
1.4.1	$\text{Cost of the call} = R2,90 \times 5$ $= R14,50$ ✓M ✓A  <b>OR</b> $\text{Cost of the call} = R14,50$ ✓✓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 = $R1,90 \times 5$ ✓M = $R9,50$ ✓A  <b>OR</b>  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 = $9 \div 2,9$ ✓M = $3,1$ minutes ✓A  <b>OR</b>  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 <b>OR</b> 1RT if only 2 are correct  (2)	12.4.4
2.1.2	Total earnings = $4 \times R22\ 000$ ✓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 $= 1\ 413\ \text{cm}^2 + 3\ 600\ \text{cm}^2$ $= 5\ 013\ \text{cm}^2$ ✓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	$\therefore$ US \$250 billion = US \$250 $\times$ 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	$27\% + 32\% \checkmark M$ $= 59\% \checkmark A$  <b>OR</b>  $100\% - 41\% \checkmark M$ $= 59\% \checkmark A$	1M adding 1A % not from services  <b>OR</b>  1M subtracting 1A % not from services (2)	12.1.1
2.3.3	$Services = 100\% - 15\% - 28\% \checkmark M$  $= 57\% \checkmark A$	1M subtracting  1A % from services (2)	12.4.4 12.1.1
2.3.4	$Industry = 27\% \times US\$ 250 \text{ billion} \checkmark RG \checkmark M$  $= US\$ 67,5 \text{ billion} \checkmark A$	1M using percentage 1RG reading from graph 1A % from industry (3)	12.4.4 12.1.1
2.3.5	$\% \text{ Difference} = 32\% - 15\% \checkmark RG$ $= 17\% \checkmark A$	1M finding the difference  1A simplifying (2)	12.4.4 12.1.1
2.3.6	$Agriculture = 15\% \times US\$ 1\,000\,000 \text{ billion} \checkmark RG$  $= US\$ 150\,000 \text{ billion} \checkmark A$	1M using percentage 1RG reading from graph 1A amount from Agriculture  (3)	12.4.4 12.1.1

QUESTION 3 [23 MARKS]			
Que s	Explanation	Mark Allocation	AS
3.1.1	$A = 450 + 160 \times 0,5 \quad \checkmark M$ $= 450 + 80$ $= R530 \quad \checkmark A$	1M finding the cost 1A cost  (2)	12.2.1
3.1.2	$B = 200 + (250 - 100) \times 2 \quad \checkmark M$ $= 200 + 150 \times 2$ $= 200 + 300 \quad \checkmark S$ $= R500 \quad \checkmark CA$	1M subtracting  1S simplification 1A cost  (3)	12.2.1
3.2	<p style="text-align: center;"><b>COST OF HIRING A CAR</b></p>	<p><b>Option X</b></p> 1A point (0 ; 450) 1A point (400 ; 650) 1A correct straight line drawn 1A label <p><b>Option Y</b></p> 1A point (0 ; 200) 1A point (100 ; 200) 1A point (400; 800) 1A points joined correctly 1A label <p style="text-align: right;">(9)</p>	12.2.2
3.3.1	300 km $\checkmark RT \quad \checkmark RT$	2RT reading from graph or table  (2)	12.2.1
3.3.2	R600 $\checkmark RT$	1RT reading from graph or table  (1)	12.2.3

Ques	Explanation	Mark Allocation	AS
3.4	$\text{Time} = \frac{180 \text{ km}}{100 \text{ km/h}} \quad \checkmark \text{SF}$ $= 1,8 \text{ hrs} \quad \checkmark \text{A}$ $= 1 \text{ hr} + 0,8 \times 60 \text{ min}$ $= 1 \text{ hr } 48 \text{ min} \quad \checkmark \text{C}$ <p style="text-align: center;"><math>\checkmark \text{M}</math></p>	1SF substitution in formula 1A number of hours 1C converting to hr and min (3)	12.2.1 12.3.1
3.5	$\text{Litres of petrol} = \frac{258,24}{8,07} \quad \checkmark \text{SF}$ $= 32 \quad \checkmark \text{A}$	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	$P = 2\text{ m} + 8\text{ m} + 1\text{ m} + 3\text{ m} + 3\text{ m}$ $= 17\text{ m}$	1M adding the 5 sides 1A calculating 3m 1A simplifying (3)	12.3.1
4.1.2	$A = (11\text{ m} \times 3\text{ m}) - (8\text{ m} \times 1\text{ m})$ $= 33\text{ m}^2 - 8\text{ m}^2$ $= 25\text{ m}^2$ <p><b>OR</b></p> $A = (3\text{ m} \times 3\text{ m}) + (8\text{ m} \times 2\text{ m})$ $= 9\text{ m}^2 + 16\text{ m}^2$ $= 25\text{ m}^2$	1M finding area of patio 1SF substitution  1CA area of patio 1A correct unit  <b>OR</b> 1M finding area of patio 1SF substitution 1CA area of patio 1A correct unit (4)	12.3.1
4.2.1 (a)	$A = \frac{60\text{ hours}}{2}$ $= 30\text{ hours}$	 1M dividing 1A number of hours (2)	12.2.3
4.2.1 (b)	$B \times 15 = 60$ $B = \frac{60}{15}$ $= 4\text{ workers}$	1M dividing 1A simplifying (2)	12.2.3
4.2.2	Indirect/Inverse proportion	1A type of proportion (1)	12.2.3
4.3.1	$V = 3,14 \times (20\text{ cm})^2 \times 60\text{ cm}$ $= 75\,360\text{ cm}^3$	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 $= 2 \times 3,14 \times 20 \times 80 \text{ cm}^2 \quad \checkmark\text{SF}$ $= 10\,048 \text{ cm}^2 \quad \checkmark\text{A}$	SF substitution in formula 1A surface area (2)	12.3.1
4.4	$\begin{aligned} \text{Costs} &= (6 \times \overset{\checkmark\text{M}}{\text{R}45,50}) + (4 \times \text{R}19,99) \quad \checkmark\text{M} \\ &= \overset{\checkmark\text{S}}{\text{R}273,00} + \text{R}79,96 \\ &= \text{R}352,96 \quad \checkmark\text{CA} \end{aligned}$	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) $= \frac{R\,5\,525 + 5\,500 + 5\,980 + 6\,250 + 6\,250 + 6\,250 + 6\,300 + 7\,800 + 8\,200 + 8\,900}{10}$ ✓M ✓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 ✓M $\frac{3}{10} \times 100\%$ $= 30\%$ ✓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	$A = P(1 + i)^n$ <p style="text-align: center;"> <span style="margin-right: 100px;">✓SF</span> <span>✓A</span> </p> $= R6\,350 (1 + 0,058)^2$ $= R7\,107,9614$ <p style="text-align: center;">✓CA</p> $\approx R7\,107,96$ <p style="text-align: center;">✓R</p>	1A value of $i$  1SF substitution  1CA amount 1R rounding off to the nearest cent  (4)	12.1.1 12.2.1



<b>QUESTION 6 [19 MARKS]</b>			
<b>Ques</b>	<b>Explanation</b>	<b>Mark Allocation</b>	<b>AS</b>
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	<p>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</p> <p><b>OR</b></p> <p>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</p> <p><b>OR</b></p> <p>Any other possible route.</p>	<p>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</p> <p><b>OR</b></p> <p>1A turning into St George’s Street 1A turning into Markgraaf Street 1A turning into Zastron Street 1A entry into the club</p> <p>(4)</p>	12.3.1
6.1.4	<p>7 cm on map = <math>7 \times 20\,000</math> cm in real life = 140 000 cm ✓M = <math>\frac{140\,000}{100}</math> m = 1 400 m ✓A = <math>\frac{1\,400}{1\,000}</math> km = 1,4 km ✓CA</p>	<p>1M multiplication  1A converting to m  1CA simplifying</p> <p>(3)</p>	12.3.3 12.3.1
6.2.1	<p>Final Score = <math>(3 \times 5) + (0 \times 2) + (4 + 1) \times 3</math> ✓SF ✓A = <math>15 + 0 + 5 \times 3</math> ✓CA = 30 ✓CA</p>	<p>1SF substitution 1A correct values used 1CA simplification 1CA simplifying</p> <p>(4)</p>	12.2.1

Ques	Explanation	Mark Allocation	AS															
6.2.2	<p style="text-align: center;"><b>RECORD OF POINTS SCORED</b></p> <table border="1" style="margin-left: auto; margin-right: auto;"> <caption>Data from Record of Points Scored</caption> <thead> <tr> <th>Method of scoring points</th> <th>At home</th> <th>Away</th> </tr> </thead> <tbody> <tr> <td>Tries</td> <td>15</td> <td>10</td> </tr> <tr> <td>Conversions</td> <td>12</td> <td>6</td> </tr> <tr> <td>Penalties</td> <td>21</td> <td>27</td> </tr> <tr> <td>Drop goals</td> <td>12</td> <td>15</td> </tr> </tbody> </table>	Method of scoring points	At home	Away	Tries	15	10	Conversions	12	6	Penalties	21	27	Drop goals	12	15	<p>5A One for each bar</p> <p style="text-align: right;">(5)</p>	<p>12.4.2</p>
Method of scoring points	At home	Away																
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**TOTAL: 150**