



# basic education

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

## NATIONAL SENIOR CERTIFICATE

**GRADE 12**

**MATHEMATICAL LITERACY P1**


**NOVEMBER 2011**

**MEMORANDUM**

**MARKS: 150**

<b>Symbol</b>	<b>Explanation</b>
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 15 pages**


<b>QUESTION 1 [34 MARKS]</b>			
<b>Ques</b>	<b>Solution</b>	<b>Explanation</b>	<b>AS</b>
1.1.1	$241,50(124,37 - 121,79) + \sqrt{232,5625}$ $= 623,07 + 15,25 \quad \checkmark A$ $= 638,32 \quad \checkmark CA$	1A simplifying both terms  1CA simplification <b>Answer only full marks</b> (2)	12.1.1
1.1.2	$25,5 \div 100 \quad \checkmark M$ $= 0,255 \text{ m} \quad \checkmark A$	1M dividing by 100  1A simplification <b>Answer only full marks</b> (If 0,26 penalize 1 mark) (2)	12.3.2
1.1.3	$2\frac{1}{2} \times 12 \quad \checkmark M$ $= 30 \text{ eggs} \quad \checkmark CA$  <b>OR</b>  $12 + 12 + 6 \quad \checkmark M$ $= 30 \text{ eggs} \quad \checkmark CA$	 1M concept of dozen  1CA simplification  <b>Answer only full marks</b> (2)	12.1.2
1.1.4	$01:04 \quad \checkmark \checkmark A$ <b>OR</b> 1:04 am  <b>OR</b> 4 min after 1 in the morning.	2A answer  (2)	12.3.2
1.1.5	$36 \text{ m} \div 4 = 9 \text{ m} \quad \checkmark A$	1M dividing 1A answer  <b>Answer only full marks</b> (2)	12.3.1
1.1.6	1 <b>OR</b> 100% <b>OR</b> certain <b>OR</b> definite $\checkmark \checkmark A$	2A answer  (2)	12.4.5

Ques	Solution	Explanation	AS
1.2.1	$20 \times 0,95 \checkmark M$ $= 19 \text{ Botswana pula (BWP)} \checkmark A$ <p style="text-align: center;"><b>OR</b></p> $1 \text{ Botswana pula (BWP)} = \frac{1}{0,95} \text{ ZAR}$ $= 1,0526316 \text{ ZAR} \checkmark M$ $R20 = \frac{20}{1,0526316} \text{ BWP}$ $= 19 \text{ BWP} \checkmark A$ <p style="text-align: center;"><b>OR</b></p> $2 \times 20 \times 0,95 \checkmark M$ $= 38 \text{ Botswana pula (BWP)} \checkmark A$	1M multiplying 1A simplification <b>Answer only full marks</b> Penalty of 1 mark if answer is in rand. 1M dividing 1A simplification 1M multiplying 1A simplification (2)	12.1.3
1.2.2	Total amount due $= (10 \times 360\,286 \text{ ZMK}) + (8 \times 85\,134 \text{ ZMK})$ $\quad - 1\,021\,605 \text{ ZMK}$ $= (3\,602\,860 + 681\,072 - 1\,021\,605) \text{ ZMK}$ $= 3\,262\,327 \text{ ZMK} \checkmark CA$	1M /A substitution 1CA multiplication 1CA simplification <b>Answer only full marks</b> No penalty if answer is given with comma separators for thousands (3)	12.2.1
1.2.3	$\text{Speed} = \frac{180 \text{ km}}{2,25 \text{ h}} \checkmark SF \checkmark C \quad \text{OR} \quad \frac{180 \text{ km}}{2\frac{1}{4} \text{ h}} \quad \text{OR} \quad \frac{180 \text{ km}}{2 \text{ h } 15 \text{ min}}$ $= 80 \text{ km/h} \checkmark CA$ <p style="text-align: center;"><b>OR</b></p> $\text{Speed} = \frac{180 \text{ km}}{135 \text{ min}} \checkmark SF$ $= 1,33 \text{ km/min} \times 60 \text{ min/h} \checkmark C$ $= 80 \text{ km/h} \checkmark CA$	1SF substitution 1C conversion to hours 1CA simplification <b>Answer only full marks</b> 1SF substitution 1C conversion to hours 1CA simplification (3)	12.2.1

Ques	Solution	Explanation	AS
1.3.1 (a)	$500\,000\,000 - 106\,000\,000 \checkmark M$ $= 394\,000\,000 \checkmark A$  <b>OR</b> $500\text{ million} - 106\text{ million} \checkmark M$ $\checkmark A$ $= 394\text{ million}$	1M subtracting 1A simplification <b>Answer only full marks</b>  Penalty 1 mark if answer negative.  (2)	12.1.1
1.3.1 (b)	$106\,000\,000 - 50\,880\,000 \checkmark M$ $= 55\,120\,000 \checkmark A$  <b>OR</b> $106\text{ million} - 50,88\text{ million} \checkmark M$ $= 55,12\text{ million} \checkmark A$	1M subtracting (one value must be correct) 1A simplification <b>Answer only full marks</b>  (2)	12.1.1
1.3.1 (c)	$\frac{230\,000\,000}{500\,000\,000} \times 100\% \checkmark M$ $= 46\% \checkmark CA$  <b>OR</b> $\frac{230\text{ million}}{500\text{ million}} \times 100\% \checkmark M$ $= 46\% \checkmark CA$	1M concept 1A correct values  1CA simplification  (3)	12.1.1
1.3.2 (a)	Cellphone <b>OR</b> laptop <b>OR</b> iPad <b>OR</b> tablet <b>OR</b> GPS-device $\checkmark A$	1A answer (accept brand names ) (1)	12.4.4
1.3.2 (b)	30 % $\checkmark RG$	1RG answer (1)	12.4.4
1.3.2 (c)	$100\% - 12\% \checkmark M$ $= 88\% \checkmark A$	1M subtraction from 100% 1A simplification <b>Answer only full marks</b>  (2)	12.4.4
1.3.2 (d)	$27\% \times 106\text{ million} \checkmark M$ $= 28\,620\,000 \text{ OR } 28,62\text{ million} \checkmark CA$	1RG correct values 1M concept of percentage  1CA simplification <b>Answer only full marks</b>  (3)	12.4.4 12.1.1
			[34]

<b>QUESTION 2 [28 MARKS]</b>			
<b>Ques</b>	<b>Solution</b>	<b>Explanation</b>	<b>AS</b>
2.1.1	27 °C ✓RG	1RG answer No penalty for omitting unit (1)	12.4.4
2.1.2	Harare ✓✓RG <b>OR</b> New Delhi ✓✓RG	2RG answer (maximum 1 mark if two cities given and one is wrong) (2)	12.4.4
2.1.3	Amsterdam ✓RG	1RG answer (1)	12.4.4
2.1.4	Harare ✓✓RG	2RG answer (2)	12.4.4
2.1.5	8 °C – (–2 °C) ✓M/A = 10 °C ✓CA  <b>OR</b> Start at (–2 °C) and count until 8 °C ✓M/A ∴ Range = 10 °C ✓CA	1M/A concept of range 1CA simplification  <b>Answer only full marks</b> (2)	12.4.3
2.1.6	Temperature in °F = $1,8 \times 13^\circ + 32^\circ$ ✓SF = 55,4° ✓CA	1SF substitution of 13° 1CA simplification <b>Answer only full marks</b> (2)	12.3.2
2.2.1	Northern Cape ✓RG	1RG answer (1)	12.4.4
2.2.2	Free State and Western Cape ✓RG	2RG answer (2)	12.4.4
2.2.3	Mpumalanga ✓✓RG <b>OR</b> Western Cape ✓✓RG	2RG answer (penalty of 1 if one province is wrong) (2)	12.4.4
2.2.4	100 % – (6,5 + 29,7 + 9,5 + 10,6 + 13,9 + 10,6 + 1,4 + 7,6) % ✓M = 10,2 % ✓A	1M concept 1A simplification <b>Answer only full marks</b> (2)	12.4.4

Ques	Solution	Explanation	AS
2.2.5	$\frac{3\,249\,415}{6,5\%} \checkmark M$ $= \frac{3\,249\,415}{0,065} \quad \text{OR} \quad \frac{3\,249\,415}{6,5} \times \frac{100}{1}$ $= 49\,991\,000 \checkmark CA$ <p style="text-align: center;"><b>OR</b></p> <p>6,5% of the population = 3 249 415 <math>\checkmark RG</math></p> <p>1% of the population = 499 910 <math>\checkmark M</math></p> <p>100% of the population = 49 991 000 <math>\checkmark CA</math></p>	<p>1M concept 1RG correct percentage</p> <p>1CA simplification</p> <p>(maximum 2 marks if they use land area percentage) Penalty 1 mark if answer is not a whole number</p> <p><b>Answer only full marks</b></p> <p style="text-align: right;">(3)</p>	12.1.1 12.4.4
2.3.1	1 hour $\checkmark \checkmark RG$	2RG answer (accept 1:00 or 01:00)	12.2.3
2.3.2	<p>Accept any value more than 3 hours <math>\checkmark \checkmark RG</math> and up to 4 hours</p> <p style="text-align: center;"><b>OR</b></p> <p><math>3 &lt; \text{hours} \leq 4</math> <b>OR</b> (3 ; 4]</p>	2RG answer	12.2.3
2.3.3	R20,00 $\checkmark \checkmark RG$	2RG answer	12.2.3
2.3.4	R7,00 $\checkmark \checkmark RG$	2RG answer	12.3.2
			<b>[28]</b>

<b>QUESTION 3 [23 MARKS]</b>			
<b>Ques</b>	<b>Solution</b>	<b>Explanation</b>	<b>AS</b>
3.1.1	$A = R400 - R210 = R190 \quad \checkmark^M \quad \checkmark^A$ $B = R25,00 \times 30 = R750 \quad \checkmark^M \quad \checkmark^{CA}$ $C = 4 \times R110 = R440 \quad \checkmark^M \quad \checkmark^A$ $D = 4 \times R125 = R500 \quad \checkmark^M \quad \checkmark^A$	1M subtracting 1A simplification  1M multiplying 1CA simplification (maximum 1 mark if not using 30 days)  1M multiplying 1A simplification  1M multiplying 1A simplification  <b>Answer only full marks</b>  (8)	12.1.3
3.1.2	$R2\ 500 - R2\ 330 \quad \checkmark^M$ $= R170 \quad \checkmark^{CA}$	1M subtracting 1CA simplification (no penalty if answer is negative)  (2)	12.1.3
3.1.3	Use at least one of her weekend entertainment money allowances <span style="float: right;"></span>  <p style="text-align: center;"><b>OR</b></p> Reduce food expenses to save R30. <span style="float: right;"><math>\checkmark\checkmark^A</math></span>  <p style="text-align: center;"><b>OR</b></p> (any other suitable answer)	2A answer          (2)	12.1.2

Ques	Solution	Explanation	AS
3.2	$A = P(1+i)^n,$ $= R125 \left(1 + \frac{8}{100}\right)^3 \checkmark^A \checkmark^M \quad \text{OR} \quad R125(1+0,08)^3$ $= R157,464$ $\approx R157,46 \checkmark^{CA}$ <p style="text-align: center;"><b>OR</b></p> <p>For a year: <math>R125 \times 52 = R6\,500</math></p> $A = P(1+i)^n,$ $= R6\,500 \left(1 + \frac{8}{100}\right)^3 \checkmark^A \checkmark^M$ $= R8\,188,23 \text{ per annum}$ $= R157,464 \text{ per week}$ $\approx R157,46 \checkmark^{CA}$	<p>1M substitution 1A correct value of n</p> <p>1CA simplification</p> <p>1M substitution 1A correct value of n</p> <p>1CA simplification (3)</p>	12.1.3
3.3.1	$\checkmark^A$ <p>Row 5 column 2 <math>\checkmark^A</math></p>	<p>1A row 1A column (2)</p>	12.3.4
3.3.2	$3 \checkmark^{CA} \quad \text{OR} \quad 4 \checkmark^{CA}$	<p>1CA answer (1)</p>	12.3.4
3.3.3	$\checkmark^A \checkmark^A$ <p>South-east <b>OR</b> North-west <b>OR</b> South-west <b>OR</b> North-east</p> <p><b>OR</b> To the right at the back <b>OR</b> To the left in front</p>	<p>2A answer (2)</p>	12.3.4
3.3.4	$\checkmark^A$ <p>Total area = <math>32 \times 0,75 \text{ m}^2 \checkmark^M</math></p> $= 24 \text{ m}^2 \checkmark^{CA}$	<p>1A using correct values 1M multiplying by whole number 1CA simplification from multiplication (3)</p>	12.3.1 12.1.1
			<b>[23]</b>



<b>QUESTION 4 [16 MARKS]</b>			
<b>Ques</b>	<b>Solution</b>	<b>Explanation</b>	<b>AS</b>
4.1.1	6 ✓✓A	2A answer (2)	12.4.3
4.1.2	$6\frac{1}{2}$ ✓✓A	2A answer (2)	12.4.3
4.1.3	$5\frac{1}{2}$ ✓✓A <b>OR</b> $\frac{5\frac{1}{2} + 5\frac{1}{2}}{2} = 5\frac{1}{2}$ ✓✓A	1A for identifying the $5\frac{1}{2}$ & $5\frac{1}{2}$ as the middle values 1A answer <b>Answer only full marks</b> (2)	12.4.3
4.1.4	$3\frac{1}{2}$ , 4, $4\frac{1}{2}$ ; $5\frac{1}{2}$ (accept answers less than 5 or answers greater than 11 or any size not in boys data) ✓✓A	1A for every 2 correct sizes 1A for every 2 correct sizes (2)	12.4.3
4.1.5	$14 : 15$ ✓A ✓A ✓M	1M writing as a ratio 1A value for boys 1A value for girls (3)	12.4.3 12.1.1
4.2.1	Volume = length × breadth × height ✓M = 27,5 cm × 15 cm × 11,9 cm = 4 908,75 cm <sup>3</sup> ✓A✓A	1M substitution 1A simplification 1A correct unit <b>Answer only full marks</b> (3)	12.3.1
4.2.2	Number of boxes = $\frac{118\text{cm}}{11,9\text{cm}}$ ✓M = 9,915 = 9 ✓CA	1M division by 11,9 cm only  1CA maximum <b>Answer only full marks</b> (2)	12.1.1 12.1.2
			<b>[16]</b>

<b>QUESTION 5 [25 MARKS] (One penalty for incorrect rounding in this question only)</b>			
<b>Ques</b>	<b>Solution</b>	<b>Explanation</b>	<b>AS</b>
5.1.1	$\text{Volume} = 3,14 \times (18,5 \text{ mm})^2 \times 10 \text{ mm} \quad \checkmark\text{M}$ $= 10\,746,65 \text{ mm}^3 \quad \checkmark\text{A} \quad \checkmark\text{A}$ <p style="text-align: center;">(using <math>\pi : V = 10\,752,10 \text{ mm}^3</math>)</p>	1M substitution 1A simplification 1A unit <b>Answer only full marks</b> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 5px auto;">             Penalize only once in 5.1.1 or 5.1.2 for unit           </div> <p style="text-align: right;">(3)</p>	12.3.1
5.1.2	$\text{Volume} = \frac{1}{2} \times 50 \text{ mm} \times 43,3 \text{ mm} \times 10 \text{ mm} \quad \checkmark\text{M}$ $= 10\,825 \text{ mm}^3 \quad \checkmark\text{A} \quad \checkmark\text{A}$	1M substitution 1A simplification 1A unit <b>Answer only full marks</b> <p style="text-align: right;">(3)</p>	12.3.1
5.1.3	Total surface area of cylinder $= 2 \times 3,14 \times 18,5 \text{ mm} \times (18,5 \text{ mm} + 10 \text{ mm}) \quad \checkmark\text{SF}$ $= 2 \times 3,14 \times 18,5 \text{ mm} \times 28,5 \text{ mm} \quad \checkmark\text{CA}$ $= 3\,311,13 \text{ mm}^2 \quad \checkmark\text{A}$ <p style="text-align: center;">(using <math>\pi : \text{TSA} = 3\,312,81 \text{ mm}^2</math>)</p>	1SF substitution 1A addition 1CA simplification 1A unit <b>Answer only full marks</b> <p style="text-align: right;">(4)</p>	12.3.1
5.1.4	Total surface area of triangular prism $= (50 \text{ mm} \times 43,3 \text{ mm}) + 3(50 \text{ mm} \times 10 \text{ mm}) \quad \checkmark\text{SF}$ $= 2\,165 \text{ mm}^2 + 1\,500 \text{ mm}^2 \quad \checkmark\text{A}$ $= 3\,665 \text{ mm}^2 \quad \checkmark\text{CA}$	1SF substitution 1A multiplication 1CA simplification <b>Answer only full marks</b> <p style="text-align: right;">(3)</p>	12.3.1

Ques	Solution	Explanation	AS
5.2.1	1 sheet of gold foil wraps 12 chocolates ✓M 10 sheets wraps 120 chocolates ✓A ✓M	1M concept 1A simplification Answer only full marks (2)	12.2.1
5.2.2	Number of round chocolates = $6 \times (5 + 7)$ ✓SF = 72 ✓CA	1 M using correct formula 1 SF substitution 1CA simplification Answer only full marks (3)	12.2.1
5.2.3	Number of triangular chocolates = $4 \times (5 + 7) + (12 \times 10)$ ✓M ✓SF = 168 ✓CA	1M using correct formula 1 SF substitution 1CA simplification Answer only full marks (3)	12.2.1
5.3.1	$\frac{13}{50}$ ✓A OR 0,26 OR 26% ✓A	1A numerator 1A denominator (2)	12.4.5
5.3.2	$\frac{0}{50}$ ✓✓A OR 0 OR 0% OR impossible OR none	2A answer (2)	12.4.5
			[25]





Ques	Solution	Explanation	AS																					
6.1.3	<table border="1"> <thead> <tr> <th>Number of goals scored</th> <th>0</th> <th>2</th> <th>4</th> <th>Q</th> <th>7</th> <th>8</th> </tr> </thead> <tbody> <tr> <td>Option A (in rand)</td> <td>4 600</td> <td>P</td> <td>5 600</td> <td>6 100</td> <td>6 350</td> <td>6 600</td> </tr> <tr> <td>Option B (in rand)</td> <td>4 000</td> <td>4 800</td> <td>5 600</td> <td>6 400</td> <td>6 800</td> <td>7 200</td> </tr> </tbody> </table> <p style="text-align: center;"><b>TOTAL BONUS PAYMENT FOR EACH PLAYER</b></p>	Number of goals scored	0	2	4	Q	7	8	Option A (in rand)	4 600	P	5 600	6 100	6 350	6 600	Option B (in rand)	4 000	4 800	5 600	6 400	6 800	7 200	<p>1A vertical-intercept (0 ; 4 600)</p> <p>1CA any other point correctly plotted</p> <p>1CA correct line though P and Q and all other points correct</p> <p>1A label</p> <p style="text-align: right;">(4)</p>	12.2.2
Number of goals scored	0	2	4	Q	7	8																		
Option A (in rand)	4 600	P	5 600	6 100	6 350	6 600																		
Option B (in rand)	4 000	4 800	5 600	6 400	6 800	7 200																		
6.1.4	Point Y on Annexure A ✓✓CA	<p>2 CA correct position</p> <p style="text-align: right;">(2)</p>	12.2.3																					

Ques	Solution	Explanation	AS
6.2.1 (a)	Perimeter = $2(98 \text{ m} + 72 \text{ m}) \checkmark \text{M}$ $= 340 \text{ m} \checkmark \text{A} \checkmark \text{A}$	1M substitution 1A simplification 1A unit <hr/> <b>Answer only full marks</b> (3)	12.3.1
6.2.1 (b)	Area of circle = $\pi r^2$ $= 3,14 \times (16 \text{ m})^2 \checkmark \text{SF}$ $= 803,84 \text{ m}^2 \checkmark \text{A}$  Area of semi-circle = $\frac{803,84 \text{ m}^2}{2}$ $= 401,92 \text{ m}^2 \checkmark \text{CA}$  <b>OR</b> Area of semi-circle = $\frac{1}{2} \pi r^2 \checkmark \text{M}$ $= \frac{1}{2} \times 3,14 \times (16 \text{ m})^2 \checkmark \text{SF}$ $= 401,92 \text{ m}^2 \checkmark \text{CA}$ ( using $\pi \text{ A} = 402,12 \text{ m}^2$ )	1SF substitution 1A Area of circle  1CA Area semi-circle  1M $\frac{1}{2}$ of area of circle 1SF substitution 1CA Area semi-circle <hr/> <b>Answer only full marks</b> (3)	12.3.1

Ques	Solution	Explanation	AS
6.2.2	<p>8,5 m takes 25 minutes</p> <p>100 m will take <math>\frac{100 \text{ m} \times 25 \text{ minutes}}{8,5 \text{ m}}</math> ✓M  <math>= 294,11 \text{ minutes}</math> ✓A  <math>= 4,90 \text{ hours}</math> ✓CA</p> <p><b>OR</b></p> <p>100 m will take <math>\frac{100 \text{ m} \times \frac{25}{60}}{8,5 \text{ m}}</math> ✓A ✓M  <math>= 4,90 \text{ hours}</math> ✓CA</p> <p><b>OR</b></p> <p>1 m will take <math>\frac{25}{8,5} \text{ hours} = \frac{50}{17} \text{ hours}</math> ✓M  <math>\therefore 100 \text{ m will take } \frac{50}{17} \times 100 \div 60 \text{ hours}</math> ✓A  <math>= 4,90 \text{ hours}</math> ✓CA</p> <p><b>OR</b></p> <p>8,5 : 25 = 100 m : x</p> <p><math>x = \frac{25 \times 100}{8,5} \div 60 \text{ hours}</math> ✓M ✓A  <math>= 4,90 \text{ hours}</math> ✓CA</p> <p><b>OR</b></p> <p>100 ÷ 8,5 = 11,7647 ✓M  <math>11,7647 \times 25 \text{ min} = \frac{294}{60} \text{ hours}</math> ✓A  <math>= 4,90 \text{ hours}</math> ✓CA</p> <p><b>OR</b></p> <p><math>\frac{25}{8,5} = \frac{x}{100}</math> ✓M ✓A  <math>8,5x = \frac{25 \times 100}{60}</math>  <math>x = 4,90 \text{ hours}</math> ✓CA</p>	<p>1M using proportion concept</p> <p>1A solution in minutes  1CA solution in hours</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <math>4,90 = 4 \frac{54}{60} = 4 \frac{9}{10}</math> </div> <p>1M using proportion concept</p> <p>1A conversion to hours</p> <p>1CA solution in hours</p> <p>1M using proportion concept</p> <p>1A conversion to hours</p> <p>1CA solution in hours</p> <p>1M using proportion concept</p> <p>1A conversion to hours</p> <p>1CA solution in hours</p> <p>1M using proportion concept</p> <p>1A conversion to hours</p> <p>1CA solution in hours</p> <p>1M using proportion concept</p> <p>1A conversion to hours</p> <p>1CA solution in hours</p>	<p>(3)</p>
			<b>[24]</b>

**TOTAL: 150**