



# basic education

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

## NATIONAL SENIOR CERTIFICATE

**GRADE 12**

**MATHEMATICAL LITERACY P2**

**FEBRUARY/MARCH 2014**

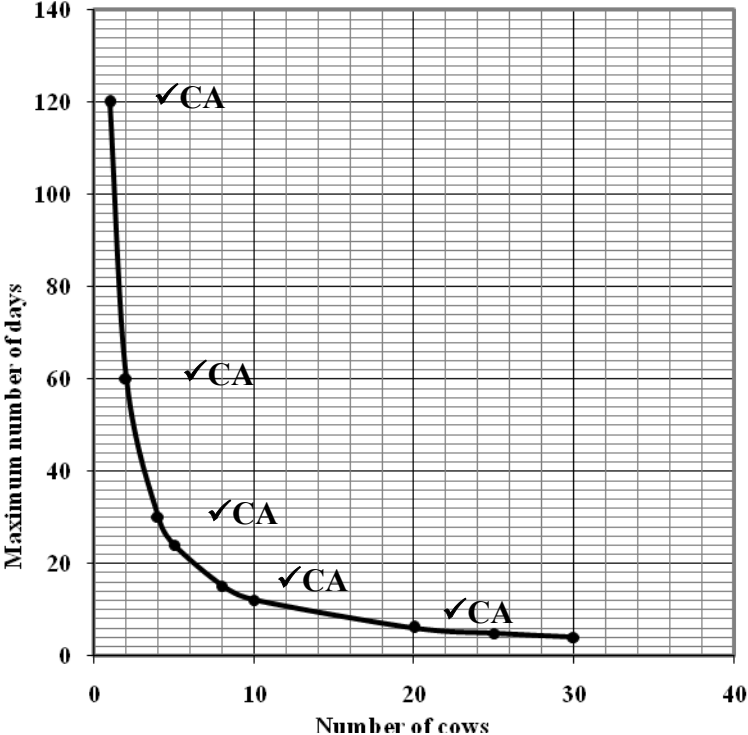
**MEMORANDUM**

**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
J	Justification/reason

**This memorandum consists of 14 pages.**

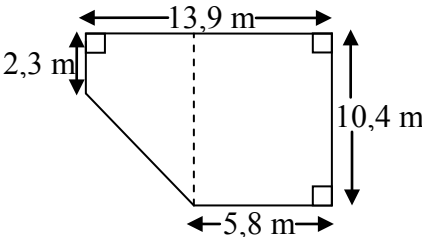
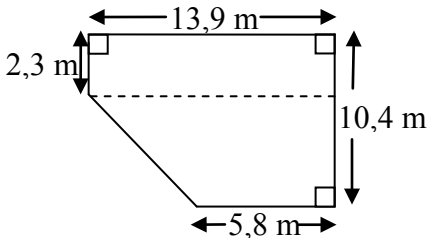
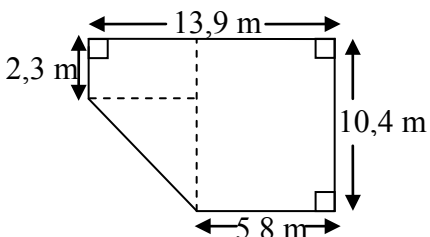
QUESTION 1 [31 MARKS]			
Ques	Solution	Explanation	AS/L
1.1.1	$\text{Curved area of the cylinder} = 2 \times 3,14 \times 70 \text{ cm} \times 140 \text{ cm} \checkmark\text{SF}$ $= 61\,544 \text{ cm}^2 \checkmark\text{CA}$ $\text{Area of wrap} = 1,06 \text{ cm} \times 61\,544 \text{ cm}^2 \checkmark\text{M}$ $= 65\,236,64 \text{ cm}^2 \checkmark\text{CA}$ <p style="text-align: center;"><b>OR</b></p> $\text{Area of wrap: } \frac{6}{100} \times 61\,544 \text{ cm}^2 = 3\,692,64 \text{ cm}^2 \checkmark\text{M}$ $\therefore \text{Area of wrap} = 61\,544 \text{ cm}^2 + 3\,692,64 \text{ cm}^2 \checkmark\text{A}$ $= 65\,236,64 \text{ cm}^2 \checkmark\text{CA}$	1A circumference 1SF substitution 1CA curved area  1A increasing by 6% 1M concept 1CA area  <b>OR</b> 1M concept of %  1A increasing by 6% 1CA area  (6)	12.3.1 L3
1.1.2	$\text{Volume} = 3,14 \times (70 \text{ cm})^2 \times 140 \text{ cm} \checkmark\text{SF}$ $= 2\,154\,040 \text{ cm}^3 \checkmark\text{CA}$ $\text{Total surface area} = 2 \times 3,14 \times 70 \text{ cm}(70 \text{ cm} + 140 \text{ cm})$ $= 439,6 \text{ cm} \times (210 \text{ cm})$ $= 92\,316 \text{ cm}^2 \checkmark\text{CA}$ $\text{Volume: Total surface area} = 2\,154\,040 : 92\,316 \checkmark\text{M}$ $= 23,333 : 1$ $\approx 23 : 1 \checkmark\text{CA}$ $\therefore \text{Mathys' bales do conform.} \checkmark\text{CA}$	1SF substitution 1CA simplification  1CA simplification  1M writing as a ratio  1CA ratio in required form 1CA conclusion  (6)	12.3.1 L3
1.1.3	$\text{Temperature in } ^\circ\text{F} = \frac{9}{5} \times 55^\circ + 32^\circ \checkmark\text{SF}$ $= 131^\circ \checkmark\text{CA}$ <p><math>\checkmark\text{CA}</math> No, his action was not correct.</p>	1SF substitution  1CA temperature in $^\circ\text{F}$  1CA verification  (3)	12.3.2 L4
1.2	$1^{\text{st}} \text{ layer} = 12 \text{ bales} \checkmark\text{A}$ $2^{\text{nd}} \text{ layer} = 5 \text{ bales}$ $3^{\text{rd}} \text{ layer} = 4 \text{ bales} \checkmark\text{A}$ $4^{\text{th}} \text{ layer} = 3 \text{ bales} \checkmark\text{A}$ $\text{Total number of bales} = 12 + 5 + 4 + 3 \checkmark\text{M}$ $= 24 \checkmark\text{CA}$	1A number of bales in 1 <sup>st</sup> layer 1A number of bales in 3 <sup>rd</sup> layer 1A number of bales in last (4 <sup>th</sup> ) layer 1M adding 1CA simplification  (5)	12.1.1 L3

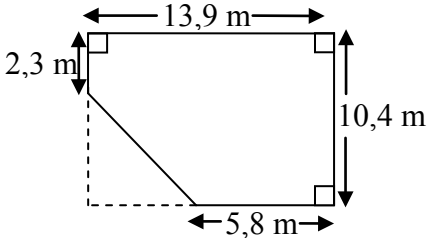
Ques	Solution	Explanation	AS/L
1.3.1	<p>Max number of days = <math>\frac{1440 \text{ kg} \checkmark A}{12 \text{ kg/day} \times 10 \checkmark A}</math>                      = 12 days <math>\checkmark CA</math></p> <p><b>OR</b></p> <p>Consumption per 10 cows = <math>12 \text{ kg/day} \times 10</math>                      = 120 kg/day <math>\checkmark A</math></p> <p>Max number of days = <math>\frac{1440 \text{ kg}}{120 \text{ kg/day}} \checkmark A</math>                      = 12 days <math>\checkmark CA</math></p>	<p>1A mass of each bale                      1A consumption per 10 cows                      1CA time taken</p> <p><b>OR</b></p> <p>1A mass of each bale                      1A consumption per 10 cows                      1CA time taken</p> <p>(3)</p>	12.2.1 L2
1.3.2	<p>Max number of days = <math>\frac{1440 \text{ kg} \checkmark A}{12 \text{ kg/day} \times \text{number of cows}} \checkmark M</math>                      = <math>\frac{120}{\text{number of cows}} \checkmark CA</math></p> <p><b>OR</b></p> <p>Using variables</p>	<p>1A correct values used                      1M dividing</p> <p>1CA simplified formula</p> <p>(3)</p>	12.2.1 L3
1.3.3	<p style="text-align: center;"><b>MAXIMUM NUMBER OF DAYS ONE BALE WOULD LAST TO FEED A NUMBER OF COWS</b></p>  <p>Maximum number of days</p> <p>Number of cows</p>	<p>1CA (1; 120)                      3CA any other 3 points plotted correctly                      1CA joining by means of a smooth curve</p> <p>(5)</p>	12.2.2 L3
[31]			

<b>QUESTION 2 [26 MARKS]</b>						
<b>Ques</b>	<b>Solution</b>	<b>Explanation</b>	<b>AS/L</b>			
2.1	$i = 0,072; n = 5$ $A = R650\,000(1 + 0,072)^5$ ✓SF ✓A $= R920\,210,7097$ $\approx R920\,210,71$ ✓CA	1A value of i 1SF substitution 1CA price of bus (3)	12.1.3 L3			
2.2.1	Amount (in rand) ✓A $= 400 \times \text{number of alumni members} - 1\,000$ ✓A  <b>OR</b> Using symbols	1A multiplying number by 400 1A subtracting 1 000 (2)	12.2.1 L4			
2.2.2	<p style="text-align: center;"><b>QUARTERLY CONTRIBUTION TOWARDS BUYING A NEW SCHOOL BUS</b></p> <table border="1" style="width: 100%; margin-top: 10px;"> <tr> <td style="width: 50%; padding: 5px;">                     1A starting at (10 ; 4000)                      1A point (20 ; 8 000)                      1A any other correct point between the above two points                      1A joining the points                 </td> <td style="width: 50%; padding: 5px;">                     1A for (20 ; 7 000) indicated by a circle                      1A point (35; 13 000)                      1A any other correct point between the above two points                 </td> </tr> </table> <p style="text-align: right;">(7)</p>		1A starting at (10 ; 4000) 1A point (20 ; 8 000) 1A any other correct point between the above two points 1A joining the points	1A for (20 ; 7 000) indicated by a circle 1A point (35; 13 000) 1A any other correct point between the above two points	✓A ✓A ✓A ✓A ✓A ✓A ✓A	12.2. L3
1A starting at (10 ; 4000) 1A point (20 ; 8 000) 1A any other correct point between the above two points 1A joining the points	1A for (20 ; 7 000) indicated by a circle 1A point (35; 13 000) 1A any other correct point between the above two points					
2.2.3	$\frac{8\,600 + 1\,000}{400}$ ✓M $= 24$ ✓CA <b>OR</b> 24 ✓RG	2RG reading from graph <b>OR</b> 1M calculation 1CA solution (2)	12.2.2 L3			



<b>QUESTION 3 [30 MARKS]</b>			
<b>Ques</b>	<b>Solution</b>	<b>Explanation</b>	<b>AS/L</b>
3.1.1	South East ✓ ✓ A	2A correct direction (2)	12.3.3 L2
3.1.2	<p>Exiting Hallmark, she must: ✓ A</p> <ul style="list-style-type: none"> <li>* turn left and walk until she reaches the end of the fountain</li> <li>* then turn right passing shop number 9 and then left towards entrance number 3</li> <li>* then enter Cafe Teen on the right hand side ✓ A</li> </ul> <p style="text-align: center;"><b>OR</b></p> <p>Exiting Hallmark, she must:</p> <ul style="list-style-type: none"> <li>* walk straight passing entrance number 1 ✓ A</li> <li>* then turn left at the corner and walk until she reaches the end of the fountain</li> <li>* then turn left passing shop number 11 and then right towards entrance number 3</li> <li>* enter Cafe Teen on the right hand side ✓ A</li> </ul>	<p>1A first turn and direction</p> <p>1A destination</p> <p style="text-align: center;"><b>OR</b></p> <p>1A first turn and direction</p> <p>1A destination (2)</p>	12.3.3 L3
3.1.3	Cash 4 U ✓ A	1A correct store (1)	12.3.3 L2
3.1.4	<p>The names are not alphabetical ✓ J</p> <p>The shops in the zones are not grouped together ✓ J</p>	<p>1J alphabetical order</p> <p>1J numerical order (2)</p>	12.4.2 L4
3.1.5	$P(\text{clothing shop}) = \frac{4}{13}$ ✓ A	<p>1A numerator</p> <p>1A denominator (2)</p>	12.4.5 L2

Ques	Solution	Explanation	AS/L
3.2.1	<div style="text-align: center;">  </div> <p>Total floor space = area of rectangle + area of trapezium</p> $= \text{length} \times \text{breadth} + \frac{1}{2} (\text{sum of parallels}) \times \text{height}$ $= 5,8 \text{ m} \times 10,4 \text{ m} + \frac{1}{2} (2,3 \text{ m} + 10,4 \text{ m}) \times 8,1 \text{ m}$ $= 60,32 \text{ m}^2 + 51,44 \text{ m}^2 = 111,76 \text{ m}^2$ <p><b>OR</b></p> <div style="text-align: center;">  </div> <p>Total floor space = area of rectangle + area of trapezium</p> $= \text{length} \times \text{breadth} + \frac{1}{2} (\text{sum of parallels}) \times \text{height}$ $= 13,9 \text{ m} \times 2,3 \text{ m} + \frac{1}{2} (13,9 \text{ m} + 5,8 \text{ m}) \times 8,1 \text{ m}$ $= 31,97 \text{ m}^2 + 79,79 \text{ m}^2 = 111,76 \text{ m}^2$ <p><b>OR</b></p> <div style="text-align: center;">  </div> <p>Total floor space = area of big rectangle + area of smaller rectangle + area of triangle</p> $= \text{length} \times \text{breadth} + \text{length} \times \text{breadth} + \frac{1}{2} \times \text{base} \times \text{height}$ $= 10,4 \text{ m} \times 5,8 \text{ m} + 2,3 \text{ m} \times 8,1 \text{ m} + \frac{1}{2} \times 8,1 \text{ m} \times 8,1 \text{ m}$ $= 60,32 \text{ m}^2 + 18,63 \text{ m}^2 + 32,81 \text{ m}^2$ $= 111,76 \text{ m}^2$ <p><b>OR</b></p>	<p>1M calculating height 2SF substitution into correct formulae 2CA simplifying 1CA total floor space</p> <p><b>OR</b></p> <p>1M calculating height 2SF substitution 2CA simplification 1CA total floor space</p> <p>1M calculating height 2SF substitution 2CA simplification 1CA total floor space</p>	<p>12.3.1 L2 (3) L3 (2)</p>

Ques	Solution	Explanation	AS/L
	 <p>Total floor space = area of rectangle – area of triangle</p> $= \text{length} \times \text{breadth} - \frac{1}{2} \times \text{base} \times \text{height}$ $= 13,9 \text{ m} \times 10,4 \text{ m} - \frac{1}{2} \times 8,1 \text{ m} \times 8,1 \text{ m}$ $= 144,56 \text{ m}^2 - 32,805 \text{ m}^2$ $= 111,76 \text{ m}^2$	<p>1M calculating height 2SF substitution 2CA simplification 1CA total floor space (6)</p>	
3.2.2	<p><b>Note: The dist between the 2 entrances allow for ± 2 mm range</b></p> <p>The one horizontal measurement is 13,9 m On the question paper Hallmark is 1,2 cm ✓A On the question paper the distance from the northern entrance door to the southern entrance door is 9,3 cm ✓A</p> $\therefore \text{total distance} = \frac{9,3}{1,2} \times 13,9 \text{ ✓M}$ $\approx 107,73 \text{ m}$ <p><b>OR</b> 1,2 cm : 13,9m 1cm = 11,583 m ✓M</p> $\therefore \text{total distance} = 9,3 \times 11,583$ $\approx 107,72 \text{ m}$ <p>∴ the distance is 110 metres ✓CA</p> <p><b>OR</b></p> <p>The one vertical measurement is 10,4 m On the question paper the side is 0,9 cm ✓A On the question paper the distance from the northern entrance door to the southern entrance door is 9,3 cm ✓A</p> $\therefore \text{total distance} = \frac{9,3}{0,9} \times 10,4 \text{ ✓M}$ $\approx 107,47 \text{ m}$ <p><b>OR</b> 0,9 cm : 10,4m ✓M 1cm = 11,555.. m</p> $\therefore \text{total distance} = 9,3 \times 11,556$ $= 107,47 \text{ m}$ <p>∴ the distance is 110 metres ✓CA</p> <p><b>OR</b></p>	<p>1A measuring the side 1A measuring the total length 1M using scale and proportion 1CA total distance</p> <p><b>Note: A range of values from 1 cm to 1,4 cm will be accepted</b></p> <p>1A measuring the side 1A measuring the total length</p> <p>1M using scale and proportion 1CA total distance</p> <p><b>Note: A range of values from 0,7 cm to 1,1 cm will be accepted</b></p>	12.3.3 L4





<b>QUESTION 4 [38 MARKS]</b>			
<b>Ques</b>	<b>Solution</b>	<b>Explanation</b>	<b>AS/L</b>
4.1.1	Percentage of blacks = 79,6% ✓A  Black population in 2011 = 79,6% of 51 770 560 ✓M $= \frac{79,6}{100} \times 51\,770\,560$ $= 41\,209\,365,76 \quad \checkmark\text{CA}$ $\approx 41\,209\,366 \text{ or } 41\,209\,365 \quad \checkmark\text{R}$	1A correct percentage  1M using percentage  1CA black population 1R rounding (up or down)  (4)	12.1.1 L3
4.1.2	Number of whites = $\frac{9,6}{100} \times 44\,819\,778 \quad \checkmark\text{M/A}$ $= 4\,302\,698,688 \quad \checkmark\text{CA}$  Number of white males = $\frac{48,36}{100} \times 4\,302\,699 \quad \checkmark\text{M/A}$ $= 2\,080\,785,086$ $\approx 2\,080\,785 \quad \checkmark\text{CA}$  Thandi's calculation is NOT correct. ✓J	1M/A using percentage  1CA white population  1M/A using percentage of white males  1CA simplification  1J verification  (5)	12.4.1 L2(3) L3(2)
4.1.3	Indian population in 2001 = 1 120 494 ✓A Indian population in 2011 = 1 294 264 ✓A  $\checkmark\text{J}$ $\therefore$ Thandi's comment is not correct (the population increased)	1A number of Indians in 2001 1A number of Indians in 2011 1J conclusion  (3)	12.4.4 L4
4.2.1 (a)	Population in 2001 = 21 434 041 + 23 385 737 $= 44\,819\,778 \quad \checkmark\text{A}$  $\text{A} = 44\,819\,778 - (14\,365\,288 + 2\,215\,211)$ $= 28\,239\,279 \quad \checkmark\text{CA}$	1A population in 2001  1CA simplification  (2)	12.1.1 L3
4.2.1 (b)	Male : female = 1 : 1,08 ✓M <b>OR</b> $100 : 108 \quad \checkmark\text{M}$ $\checkmark\text{CA}$ $\checkmark\text{CA}$ 48 males and 52 females $= \frac{100}{208} \times 100$ $= 48 \text{ males } \checkmark\text{CA}$ $\therefore 52 \text{ females } \checkmark\text{CA}$	1M ratio 1CA males 1CA females  (3)	12.1.1 L4



Ques	Solution	Explanation	AS/L
4.3.2	Mean <span style="float: right;">✓M      ✓A</span> $= \frac{814+921+1\ 201+1\ 290+Q+966+864+721+828+829}{10}$ $= \frac{8\ 434 + Q}{10}$ $936 = \frac{8\ 434 + Q}{10}$ $Q = (936 \times 10) - 8\ 434$ $= 9\ 360 - 8\ 434 \quad \checkmark S$ $= 926 \quad \checkmark CA$	1A correct values used 1M concept of Mean   1S simplifying  1CA solution  (4)	12.4.3 L3
4.3.3	721; 814; 828; 829; 864; 921; 926; 966; 1 201; 1 290 ✓M  Median = $\frac{864+921}{2}$ ✓M  $= 892,5 \left. \vphantom{\frac{864+921}{2}} \right\} \checkmark CA$ $\approx 893$	1M arranging  1M concept of median  1CA solution  (3)	12.4.3 L3
4.3.4	The sample is not representative of all the schools in South Africa. <span style="float: right;">✓✓J</span>  The sample is too small compared to the number of schools in the country. <span style="float: right;">✓✓J</span>  <b>OR</b> Any other suitable reasons.	2J reason   2J reason   (4)	12.4.4 L4
		[38]	

<b>QUESTION 5 [25 MARKS]</b>			
<b>Ques</b>	<b>Solution</b>	<b>Explanation</b>	<b>AS/L</b>
5.1.1	$\text{Loan amount} = (\text{Monthly payment} \div \text{loan factor}) \times 1\,000 \checkmark^M$ $= (\text{R}17\,550 \div 13,00) \times 1\,000 \checkmark^A \checkmark^{SF}$ $= \text{R}1\,350\,000 \checkmark^{CA}$	1M subject of formula 1A loan factor 1SF substitution  1CA solution  (4)	12.2.1 L3
5.1.2	She needs to have extra money available per month, for other expenses. $\checkmark\checkmark^J$  She will pay more on interest. $\checkmark\checkmark^J$  <b>OR</b> Any other valid reason	2J reason  2J reason  (4)	12.1.3 L4
5.2.1	<b>STL Bank:</b> $\text{Monthly payment} = (1\,100\,000 \div 1\,000) \times 13,91 \checkmark^A \checkmark^{SF}$ $= \text{R}15\,301 \checkmark^{CA}$ $\therefore \text{Total repayment} = \text{R}15\,301 \times 240 \checkmark^M$ $= \text{R}3\,672\,240 \checkmark^{CA}$ <p>Pragashni should rather take STL Bank's deal. <math>\checkmark^O</math>            Although the interest rate is higher, the year term is shorter and the total repayment amount is R4 290 000 – R3 672 240 = R617 760 less. <math>\checkmark\checkmark^J</math></p> <p style="text-align: center;"><b>OR</b></p> $\text{Monthly payment (STL Bank)} = (1\,100\,000 \div 1\,000) \times 13,91 \checkmark^A \checkmark^{SF}$ $= \text{R}15\,301 \checkmark^{CA}$ $\text{Monthly payment (EP Bank)} = (1\,100\,000 \div 1\,000) \times 13,00 \checkmark^A \checkmark^{SF}$ $= \text{R}14\,300 \checkmark^{CA}$ <p style="text-align: center;"><math>\checkmark^O</math></p> Pragashni should take EP bank his monthly instalment will be reduced by R15 301 – 14 300 = R1 001. $\checkmark\checkmark^J$	1SF substitution 1A using correct factor 1CA monthly payment 1M multiplying by 240 1CA final amount  1O choice  2J reason with calculation  <b>OR</b> 1SF substitution 1A using correct factor 1CA monthly payment 1SF substitution into formula 1CA monthly payment  1O choice 2J reason with calculation  (8)	12.1.1 12.1.3 12.2.1 L2 (3) L3(2) L4(3)

