



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

MATHEMATICAL LITERACY P1

NOVEMBER 2011

POSSIBLE ANSWERS

MARKS: 150

This memorandum consists of 15 pages

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

QUESTION 1 [34 MARKS]			
Ques	Solution	Explanation	AS
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 Answer only full marks (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 Answer only full marks (If 0,26 penalize 1 mark) (2)	12.3.2
1.1.3	$2\frac{1}{2} \times 12 \quad \checkmark M$ $= 30 \text{ eggs} \quad \checkmark CA$ <p style="text-align: center;">OR</p> $12 + 12 + 6 \quad \checkmark M$ $= 30 \text{ eggs} \quad \checkmark CA$	1M concept of dozen 1CA simplification Answer only full marks (2)	12.1.2
1.1.4	$01:04 \quad \checkmark \checkmark A$ <p style="text-align: center;">OR 1:04 am</p> OR 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 Answer only full marks (2)	12.3.1
1.1.6	1 OR 100% OR certain OR definite $\checkmark \checkmark A$	2A answer (2)	12.4.5

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

QUESTION 2 [28 MARKS]			
Ques	Solution	Explanation	AS
2.1.1	27 °C ✓RG	1RG answer No penalty for omitting unit (1)	12.4.4
2.1.2	Harare ✓✓RG OR 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	$8\text{ °C} - (-2\text{ °C})\checkmark\text{M/A}$ $= 10\text{ °C} \checkmark\text{CA}$ OR $\checkmark\text{M/A}$ Start at (-2 °C) and count until 8 °C $\therefore \text{Range} = 10\text{ °C} \checkmark\text{CA}$	1M/A concept of range 1CA simplification	12.4.3
		Answer only full marks (2)	
2.1.6	$\checkmark\text{SF}$ Temperature in °F = $1,8 \times 13^\circ + 32^\circ$ $= 55,4^\circ \checkmark\text{CA}$	1SF substitution of 13° 1CA simplification	12.3.2
		Answer only full marks (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 OR Western Cape ✓✓RG	2RG answer (penalty of 1 if one province is wrong) (2)	12.4.4
2.2.4	$\checkmark\text{M}$ $100\% - (6,5 + 29,7 + 9,5 + 10,6 + 13,9 + 10,6 + 1,4 + 7,6)\%$ $= 10,2\% \checkmark\text{A}$	1M concept 1A simplification	12.4.4
		Answer only full marks (2)	

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;">OR</p> <p>6,5% of the population = 3 249 415 $\checkmark RG$</p> <p>1% of the population = 499 910 $\checkmark M$</p> <p>100% of the population = 49 991 000 $\checkmark CA$</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>Answer only full marks</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) (2)	12.2.3
2.3.2	<p style="text-align: center;">$\checkmark \checkmark RG$</p> <p>Accept any value more than 3 hours and up to 4 hours</p> <p style="text-align: center;">OR</p> <p>$3 < \text{hours} \leq 4$ OR (3 ; 4]</p>	2RG answer (2)	12.2.3
2.3.3	R20,00 $\checkmark \checkmark RG$	2RG answer (2)	12.2.3
2.3.4	R7,00 $\checkmark \checkmark RG$	2RG answer (2)	12.3.2
			[28]

QUESTION 3 [23 MARKS]

Ques	Solution	Explanation	AS
3.1.1	$A = R400 - R210 = R190 \quad \checkmark^A$ $B = R25,00 \times 30 = R750 \quad \checkmark^{CA}$ $C = 4 \times R110 = R440 \quad \checkmark^A$ $D = 4 \times R125 = R500 \quad \checkmark^A$	1M subtracting 1A simplification 1M multiplying 1CA simplification (maximum 1 mark if not using 30 days) 1M multiplying 1A simplification 1M multiplying 1A simplification Answer only full marks (8)	12.1.3
3.1.2	$R2\ 500 - R2\ 330$ $= R170 \quad \checkmark^{CA}$	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 $\checkmark\checkmark^A$ <p style="text-align: center;">OR</p> Reduce food expenses to save R30. $\checkmark\checkmark^A$ <p style="text-align: center;">OR</p> (any other suitable answer)	2A answer (2)	12.1.2

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

QUESTION 4 [16 MARKS]			
Ques	Solution	Explanation	AS
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 OR $\frac{5\frac{1}{2} + 5\frac{1}{2}}{2} = 5\frac{1}{2}$ ✓✓A	1A for identifying the $5\frac{1}{2}$ & $5\frac{1}{2}$ as the middle values 1A answer Answer only full marks (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 ³ ✓A✓A	1M substitution 1A simplification 1A correct unit Answer only full marks (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 Answer only full marks (2)	12.1.1 12.1.2
			[16]

QUESTION 5 [25 MARKS] (One penalty for incorrect rounding in this question only)			
Ques	Solution	Explanation	AS
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: right;">(using π: $V = 10\,752,10 \text{ mm}^3$)</p>	1M substitution 1A simplification 1A unit Answer only full marks <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 Answer only full marks <p style="text-align: right;">(3)</p>	12.3.1
5.1.3	Total surface area of cylinder $= 2 \times 3,14 \times 18,5 \text{ mm} \times (18,5 \text{ mm} + 10 \text{ mm}) \quad \checkmark\text{SF}$ $= 2 \times 3,14 \times 18,5 \text{ mm} \times 28,5 \text{ mm}$ $= 3\,311,13 \text{ mm}^2 \quad \checkmark\text{CA}$ <p style="text-align: right;">(using π: $\text{TSA} = 3\,312,81 \text{ mm}^2$)</p>	1SF substitution 1A addition 1CA simplification 1A unit Answer only full marks <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 Answer only full marks <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]

QUESTION 6 [24 MARKS]			
Ques	Solution	Explanation	AS
6.1.1	$P = R4\ 600 + (R250 \times 2) \quad \checkmark\text{SF}$ $= R5\ 100 \quad \checkmark\text{A}$ $R6\ 100 = R4\ 600 + (R250 \times Q) \quad \checkmark\text{SF} \quad \text{OR} \quad R6\ 400 = R4\ 000 + (R400 \times Q) \quad \checkmark\text{SF}$ $250 \times Q = 1\ 500 \quad \checkmark\text{SF} \quad \text{OR} \quad 400 \times Q = 2\ 400 \quad \checkmark\text{SF}$ $Q = 6 \quad \checkmark\text{A} \quad \text{OR} \quad Q = 6 \quad \checkmark\text{A}$	1SF substitution 1A answer 1SF substitution 1A simplification Answer only full marks (4)	12.2.1
6.1.2 (a)	R4 000 $\checkmark\text{RT}$	1 RT answer (1)	12.2.3
6.1.2 (b)	7 $\checkmark\checkmark\text{RT}$	2RT answer (2)	12.2.3
6.1.2 (c)	The team members would earn more money from Option B $\checkmark\text{A}\checkmark\text{A}$	2 A answer (2)	12.2.3

Ques	Solution							Explanation	AS
6.1.3	Number of goals scored	0	2	4	Q	7	8	<p>12.2.2</p> <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>(4)</p>	
	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		
TOTAL BONUS PAYMENT FOR EACH PLAYER									
<p>The graph plots two linear functions: Option A and Option B. The x-axis represents 'Goals Scored' from 0 to 8, and the y-axis represents 'Payment in rand' from 3000 to 8000. Option A starts at a vertical intercept of 4600 and passes through points (2, 5100), (4, 5600), (7, 6350), and (8, 6600). Option B starts at a vertical intercept of 4000 and passes through points (2, 4800), (4, 5600), (7, 6800), and (8, 7200). A point Y is marked at (4, 5200).</p>									
6.1.4	Point Y on Annexure A ✓✓CA							<p>2 CA correct position</p> <p>(2)</p>	12.2.3

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

Ques	Solution	Explanation	AS
6.2.2	<p>8,5 m takes 25 minutes</p> <p>100 m will take $\frac{100 \text{ m} \times 25 \text{ minutes}}{8,5 \text{ m}}$ ✓M $= 294,11 \text{ minutes}$ ✓A $= 4,90 \text{ hours}$ ✓CA</p> <p>OR</p> <p>100 m will take $\frac{100 \text{ m} \times \frac{25}{60}}{8,5 \text{ m}}$ hours ✓M ✓A $= 4,90 \text{ hours}$ ✓CA</p> <p>OR</p> <p>1 m will take $\frac{25}{8,5} \text{ hours} = \frac{50}{17} \text{ hours}$ ✓M $\therefore 100 \text{ m will take } \frac{50}{17} \times 100 \div 60 \text{ hours}$ ✓A $= 4,90 \text{ hours}$ ✓CA</p> <p>OR</p> <p>$8,5 : 25 = 100 \text{ m} : x$</p> <p>$x = \frac{25 \times 100}{8,5} \div 60 \text{ hours}$ ✓M ✓A $= 4,90 \text{ hours}$ ✓CA</p> <p>OR</p> <p>$100 \div 8,5 = 11,7647$ ✓M $11,7647 \times 25 \text{ min} = \frac{294}{60} \text{ hours}$ ✓A $= 4,90 \text{ hours}$ ✓CA</p> <p>OR</p> <p>$\frac{25}{8,5} = \frac{x}{100}$ ✓M ✓A $8,5x = \frac{25 \times 100}{60}$ $x = 4,90 \text{ hours}$ ✓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;"> $4,90 = 4 \frac{54}{60} = 4 \frac{9}{10}$ </div> <p>1M using proportion concept</p> <p>1A conversion to hours 1CA solution in hours</p> <p>1M using proportion concept</p> <p>1A conversion to hours 1CA solution in hours</p> <p>1M using proportion concept</p> <p>1A conversion to hours 1CA solution in hours</p> <p>1M using proportion concept</p> <p>1A conversion to hours 1CA solution in hours</p> <p>1M using proportion concept</p> <p>1A conversion to hours 1CA solution in hours</p>	<p>12.1.1</p> <p>(3)</p>
			[24]

TOTAL: 150