



Province of the
EASTERN CAPE
EDUCATION

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

SEPTEMBER 2014

**MATHEMATICAL LITERACY P2
MEMORANDUM**

MARKS: 150

Symbol	Explanation
M	Method
MA	Method with accuracy
CA	Consistent accuracy
A	Accuracy
C	Conversion
S	Simplification
RT/RG/RM	Reading from a table/Reading from a graph/Read from map
F	Choosing the correct formula
SF	Substitution in a formula
J	Justification
P	Penalty, e.g. for no units, incorrect rounding off etc.
R	Rounding Off/Reason

This memorandum consists of 9 pages.

QUESTION 1				
1.1	Amount = $358\,110 - 258\,750$ ✓✓ $= 99\,360 \times 0.30$ ✓ $= 29\,808 + 53\,096$ ✓ $= R82\,904$ ✓		2M Subtracting by using the correct min and max values 1M Multiply by 30% 1M Addition 1CA Consistent Accuracy	(5)
1.2	Tax rebate = Primary + Secondary + Tertiary $= 12\,080 + 6\,750 + 2\,250$ ✓✓ $= R21\,080$ ✓		2M Adding all rebates 1CA Consistent Accuracy	(3)
1.3	Persons who earn R67 111 or less is exempted from paying tax. ✓✓ <p style="text-align: center;">OR</p> Any logical explanation.		2A Explanation	(2)
1.4	Income tax based on taxable income = 18% of each rand ✓ $= 0,18 \times 104\,611$ ✓ $= R18\,829,98$ $= R18\,830$ ✓ Actual Tax = Income Tax – Rebates $= 18\,830 - (12\,080 + 6\,750)$ ✓ $= 18\,830 - 18\,830$ ✓ $= R0$ ✓		1F Correct formula 1M Calculate 18% 1A Rounding to nearest rand 1M Adding rebates 1M subtract rebates from income tax 1A	(6)
1.5	1.5.1	Annual taxable salary = $22\,421 \times 12$ $= R269\,052$ ✓ Tax payable = $53\,096 + (30\% \text{ of the amount above } 258\,750)$ ✓ $= 53\,096 + 0,3 \times (269\,052 - 258\,750)$ ✓ $= 53\,096 + (0,3 \times 10\,302)$ ✓ $= 53\,096 + 3\,090,60$ ✓ $= 56\,186,60 - 12\,080$ Ann. Tax = $44\,106,60$ ✓ Monthly Tax = $44\,106,60 / 12$ $= R3\,675,55$ ✓ Agree, his was over taxed by R557,70 $(R4\,233,25 - R3\,675,55)$ ✓	1MA Monthly income x 12 1F Correct tax bracket 1S Subtraction 1CA Multiplying by 30% 1CA subtracting rebate 1CA dividing by 12 1O	(8)

1.5.2	Net salary = allowances – deductions $= 45\,742 - (3\,675,55 + 1\,685,57 + 1\,156 + 3\,230) \checkmark$ $= 45\,742 - 9\,747,12 \checkmark$ $= R35\,994,88 \checkmark$	1CA 1CA Total deductions 1CA	(3)
1.5.3	% Pension contribution $= \frac{1\,685,57 \checkmark}{22\,421 \checkmark} \times 100$ $= 7,517 \dots$ $= 7,5\% \checkmark$	2M Correct values used 1A % to 1 dec. place	(3)
1.5.4	Amount saved $= \frac{2}{3} \times 22\,421 \checkmark$ $= R\,14\,947,33 \checkmark$ <u>OPTION 1</u> $P = 14\,947,33$ $i = 9,25/200$ $= 0,04625 \checkmark$ $n = 3 \times 2$ $= 6 \checkmark$ $A = P(1 + i)^n$ $= 14\,947,33(1 + 0,04625)^6 \checkmark$ $= 14\,947,33(1,311634484) \checkmark$ $= 19\,605,43347$ $= R19\,605,43 \checkmark$ <u>OPTION 2</u> $A = P(1 + ni)$ $= 14\,947,33(1 + 0,105 \times 3) \checkmark$ $= 14\,947,33(1,315)$ $= 19\,655,73895 \checkmark$ $= R19\,655,74 \checkmark$ Difference $= R19\,655,74 - R19\,605,43 \checkmark$ $= R50,31 \checkmark$ <p style="text-align: center;">OR</p> Difference $= (19\,655,74 - 14\,947,33) - (19\,605,43 - 14\,947,33) \checkmark$ $= 4\,708,41 - 4\,658,10$ $= R50,31 \checkmark$	1M Calculating $\frac{2}{3}$ of the service bonus 1A 1A Calculating i value 1A Calculating n value 1SF Substituting in correct formule 1S 1CA Consistent Accuracy 1SF Substituting in correct formule 1S 1CA Correct rounding 1M Subtracting values of Option 1 and Option 2 1CA Consistent Accuracy	(12)

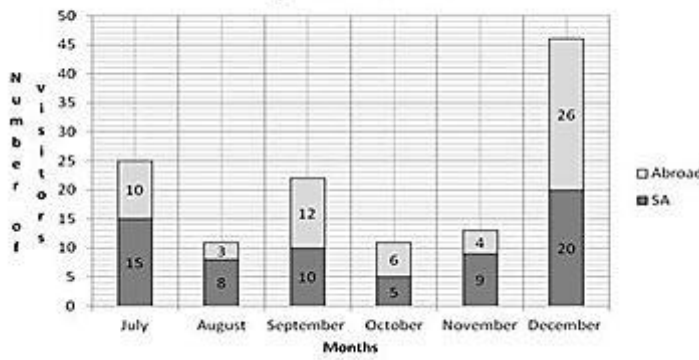
1.6	1.6.1	<p>90% OR (0,9) of roses ✓ = $12 + 15$ = 27 ✓</p> <p>Total roses = $\frac{27}{0,9}$ ✓ = 30 ✓</p>	<p>1A Finding difference as a % 1A 1M Dividing total by 90% 1CA Consistent Accuracy</p>	(4)
	1.6.2	<p>Different colours = $30 - 27$ ✓ = 3 roses ✓</p>	<p>1CA Subtracting 27 1CA Consistent Accuracy</p>	(2)
	1.6.3	<p>P(a red rose) = $\frac{12}{30}$ ✓ = 40% ✓</p>	<p>1CA correct numerator and denominator 1CA As a %</p>	(2)
	1.6.4	<p>Price of 1 rose excluding VAT = $\frac{250}{30}$ ✓ = <u>R8,333...</u> $\frac{1,14}{1,14}$ ✓ = R7,3099... ✓ = R7,31 ✓</p> <p style="text-align: center;">OR</p> <p>Price of 1 rose excluding VAT = $\frac{250}{1,14}$ ✓ = <u>219,298...</u> $\frac{30}{30}$ ✓ = R7,3099... ✓ = R7,31 ✓</p>	<p>1M Dividing 250 by 30 (CA) 1MA dividing by 1,14 1A 1CA correct rounding</p> <p> 1MA dividing 250 by 1,14 1M Dividing by 30 (CA) 1A 1CA correct rounding</p>	(4)
				[54]
QUESTION 2				
2.1	2.1.1	<p>1. Attach Cam Shaft to the Press Disc by inserting stem of the Shaft into the Press Disc's center hole. Press firmly. You will hear a click as the Shaft snaps in place. FIGURE D ✓</p> <p>2. Line the Tabs on the Motor Body up with the slots on the Cam Disc. Insert Cam Disc into the Motor Body. Using the two Grips on the Cam Disc, turning slightly clockwise until the Disc clicks into position. FIGURE E ✓</p> <p>3. Fit the Shaft all the way inside the unit, the outside contours of the 2 Discs will line up. FIGURE C ✓</p>		

		<p>4. Select a disc and place it inside the Tube cover. Then place the Tube into the Tube Cover, turning clockwise until locked. FIGURE B ✓</p> <p>5. With a spoon or spatula, load the freshly prepared dough into the top of the Tube. FIGURE A ✓</p> <p>6. Look inside the Tube to see the ridges extending from top to bottom. These ridges align with the outside contours of the 2 Discs. Grasp Tube firmly, join the Body with the filled Tube and turn clockwise until the Tube locks into position. FIGURE A ✓</p>	A 1 x 6 (Choose correct figure)	(6)
	2.1.2	Any logical and relevant explanation.	20	(2)
2.2.	2.2.1	<p>10 mm = 1 cm and 12 mm = 1,2 cm</p> <p>Height of filled tube</p> <p>= 16,5 cm – 1 cm – 1,2 cm ✓✓</p> <p>= 14,3 cm ✓</p>	<p>1C Convert both to cm</p> <p>1M Subtraction</p> <p>1A</p>	(3)
	2.2.2	<p>Maximum height to be filled</p> <p>= 0,769 x 14,3 cm ✓</p> <p>= 10,9967 cm ✓</p> <p>Height not to be filled</p> <p>= 14,3 cm – 10,9967 cm ✓</p> <p>= 3,3033 cm</p> <p>= 3,3 cm ✓</p> <p style="text-align: center;">OR</p> <p>% Difference</p> <p>= 100% – 76,9% ✓</p> <p>= 23,1% ✓</p> <p>Height not to be filled</p> <p>= 0,231 x 14,3 cm ✓</p> <p>= 3,3033 cm</p> <p>= 3,3 cm ✓</p>	<p>1M Calculate 76,9% of answer in Q2.2.1</p> <p>1CA Consistent Accuracy</p> <p>1M Subtraction</p> <p>1CA Consistent Accuracy</p> <p>1M Difference in %</p> <p>1A</p> <p>1M Calculate 23,1% of answer in Q2.2.1</p> <p>1A</p>	(4)
	2.2.3	<p>Number of cookies pressed</p> <p>= <u>14,3 cm</u></p> <p>0,5 cm ✓✓</p> <p>= 28,6 ✓</p> <p>= 28 cookies ✓</p>	<p>1C Convert 5 mm to cm</p> <p>1CA Answer in Q2.2.1(dividing)</p> <p>1A</p> <p>1CA Correct rounding</p>	(4)

2.3	2.3.1	Circumference = $2\pi r$ ✓ $17,9094 = 2 \times 3,142 \times r$ ✓ $17,9094 = 6,284r$ $\frac{17,9094}{6,284} = r$ ✓ $2,85 \text{ cm} = r$ ✓	1F Use the correct formule 1SF Correct substitution 1M Divide both sides by 6,284 1A	(4)
	2.3.2	Area = πr^2 ✓ $= 3,142 \times 2,85^2$ ✓ $= 25,520895 \text{ cm}^2$ ✓	1F Use the correct formule 1SF Correct substitution 1A	(3)
2.4		$P(\text{disc 11 and tip 8}) = \frac{1}{12} \times \frac{1}{8}$ $= \frac{1}{96}$ ✓	1MA: Correct Numerator 1MA: Correct Denominator	(2)
2.5	2.5.1	Baking time = $15 \text{ min} + 10 \text{ min}$ ✓ $= 25 \text{ min}$ ✓	1M: Adding time 1A	(2)
	2.5.2	Starting temperature $^{\circ}\text{C} = \frac{(375 - 32)}{1,8}$ ✓ $= \frac{343}{1,8}$ $= 190,555\dots$ $\approx 191^{\circ}$ ✓ Reduced temperature = $375^{\circ}\text{F} - 25^{\circ}\text{F}$ $= 350^{\circ}\text{F}$ ✓ Celsius = $\frac{(350 - 32)}{1,8}$ ✓ $= \frac{318}{1,8}$ $= 176,666\dots$ $\approx 177^{\circ}$ ✓	1SF 1A rounded to nearest $^{\circ}$ 1MA Finding the reduced temp 1SF 1A rounded to nearest $^{\circ}$	(5)
	2.5.3	Starting temperature = 200°C ✓ Reduced temperature = 180°C ✓	1A rounded to the nearest 20° 1A rounded to the nearest 20°	(2)
				[37]
QUESTION 3				
3.1	3.1.1	Craven's house = B1 ✓ Loftus Versfeld Stadium = A3 ✓	1A 1A	(2)

3.1.2	Direction = East North-east (ENE) ✓ OR North-east (NE) ✓ Compass Bearing = 63° ✓ (Accept 61° – 65°)	1A: Direction 1A: Bearing	(2)
3.1.3	1 cm on the map ✓ represents 10 000 cm ✓ OR 100 m ✓ OR 0,1 km in reality ✓	1A Refer to map 1A Refer to reality	(2)
3.1.4	<u>Possible routes</u> 1. Cross Walton Jameson Road into Villa Street, left into Farenden Street, right into Park Street. ✓✓✓ OR 2. Cross Walton Jameson Road into Villa Street, right into Farenden Street, left into Bond Street and left into Kirkness Lane. ✓✓✓ OR Any other alternate route from Spuy Road ✓✓✓	3A Route must precede Spuy Road	(3)
3.1.5	1. Distance = 13 x 0,1 km ✓✓ = 1,3 km ✓ Speed = $\frac{\text{Distance}}{\text{Time}}$ 40 km/h = $\frac{1,3 \text{ km}}{\text{Time}}$ ✓ Time = $\frac{1,3 \text{ km}}{40 \text{ km/h}}$ = 0,0325 ✓ x 60 ✓ = 1,95 min ✓ Yes, Craven's statement is true. ✓ OR 2. Distance = 14,7 x 0,1 km ✓✓ = 1,47 km ✓ Speed = $\frac{\text{Distance}}{\text{Time}}$ 40 km/h = $\frac{1,47 \text{ km}}{\text{Time}}$ ✓ Time = $\frac{1,47 \text{ km}}{40 \text{ km/h}}$ = 0,03675 ✓ x 60 ✓ = 2,205 min ✓ No, Craven's statement is not true. ✓ Allow measurement of 2 mm *Please note: work with learners' route in QUESTION 3.1.4	2A Measurement in cm 1MA x scale 1SF 1S 2CA x 60 1CA 2A Measurement in cm 1MA x scale 1SF 1S 2CA x 60 1CA	(8)

	3.1.6	Traffic lights ✓ Road works ✓ Traffic congestions ✓ (Any TWO relevant answer)	2A One mark per factor	(2)																																				
3.2	3.2.1	Range = highest value – lowest value 80 = 88 – lowest value Lowest value = 88 – 80 ✓ = 8 ✓	1M Subtracting 80 from 88 1A	(2)																																				
	3.2.2	Mean = $27+B+60+73+88+15+8+B+45+34+68+B+43+37+B+16+25+53$ ✓ 18 ✓ $40 = \frac{592 + 4B}{18}$ 40 x 18 = 592 + 4B 720 = 592 + 4B 720 – 592 = 4B ✓ $\frac{128}{4} = \frac{4B}{4}$ B = 32 ✓	1M adding all the values 1M dividing by 18 1S 1CA value of B	(4)																																				
	3.2.3	8 ; 15 ; 16 ; 25 ; 27 ; 32 ; 32 ; 32 ; 32 ; 34 ; 37 ; 43 ; 45; 53 ; 60 ; 68 ; 73 ; 88 ✓ Median = $\frac{32 + 34}{2}$ ✓ = $\frac{66}{2}$ = 33 ✓	1M/A arranging 1M median concept 1CA (A and B's values)	(3)																																				
	3.2.4	It is distorted by the outliers of 8 and 88. ✓✓	2O Opinion	(2)																																				
	3.2.5	Median ✓ Mean ✓	1A 1A	(2)																																				
				[32]																																				
QUESTION 4																																								
4.1	4.1.1	<table><tr><td>Visitors from:</td><td>July</td><td>August</td><td>September</td><td>October</td><td>November</td><td>December</td><td>Total</td><td></td></tr><tr><td>SA</td><td>15</td><td>8</td><td>10✓</td><td>5</td><td>9</td><td>20✓</td><td>67</td><td></td></tr><tr><td>Abroad</td><td>10✓</td><td>3</td><td>12</td><td>6</td><td>4</td><td>26</td><td>61</td><td></td></tr><tr><td>Total</td><td>25</td><td>11✓</td><td>22</td><td>11</td><td>13</td><td>46✓</td><td>128✓</td><td></td></tr></table>	Visitors from:	July	August	September	October	November	December	Total		SA	15	8	10✓	5	9	20✓	67		Abroad	10✓	3	12	6	4	26	61		Total	25	11✓	22	11	13	46✓	128✓		6A 1 mark for each correct answer	(6)
Visitors from:	July	August	September	October	November	December	Total																																	
SA	15	8	10✓	5	9	20✓	67																																	
Abroad	10✓	3	12	6	4	26	61																																	
Total	25	11✓	22	11	13	46✓	128✓																																	

4.1.2	<p>Number of visitors from SA and abroad from July to December</p>  <p>5A 1 Mark each for any 5 stacks correctly plotted</p> <p>1A Stacks labelled or key indicated</p>	(6)	
4.1.3	<p>Summer in South Africa ✓✓ Favourable weather conditions ✓✓ Popular tourist destination during the summer season ✓✓ (Accept any other relevant answer)</p>	20	(2)
4.1.4	<p>$P(\text{visitor in October}) = \frac{11}{128} \checkmark$ $= 0,0859375$ $= 0,086 \checkmark$</p>	1A Numerator 1A Denominator 1A to 3 decimal places	(3)
4.2	<p>Visitor from USA = $(450 \times 6) + (70 \times 7) \checkmark$ $= 2\,700 + 490$ $= R3\,190 \checkmark$</p> <p>In \$ = $\frac{3\,190}{8,17365} \checkmark$ $= 390,2785169 \times 0,5 \checkmark$ $= \\$195,139285$ $= \\$200 \checkmark$ Deposit is correct ✓</p> <p>Couple from France = $(450 \times 2 \times 6) + (70 \times 2 \times 7) \checkmark$ $= 5\,400 + 980$ $= R6\,380$</p> <p>In € = $\frac{6\,380}{10,4743384379} \checkmark$ $= 609,1076814 \times 0,5$ $= €304,5538407$ $= €300 \checkmark$ Deposit incorrect ✓</p>	1M x 450 by 6 and 70 by 7 and added 1CA (if 7 nights are used) 1M Divide by exchange rate 1M x 50% 1A to the nearest 10 10 1M x 450 by 6 x 2 and 70 by 7 x 2 and added 1CA (if 7 nights are used) 1M Divide by exchange rate 1M x 50% 1A to the nearest 10 10	(10)
			[27]
TOTAL:			150