Province of the
EASTERN CAPE
EDUCATION

NATIONAL SENIOR CERTIFICATE

GRADE 12

SEPTEMBER 2015

MATHEMATICAL LITERACY P2 MEMORANDUM

MARKS: **150**

Symbol	Explanation
M	Method
M/A	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	Correct substitution in a formula
O	Opinion/Example
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				
1.1.1	(a)	A = 97,15 x 1,08 ✓ **OR** A = 97,15 + (97,15 x 0,08) ✓ = R104, 92 ✓ = 97,15 + 7,77 = R104,92 ✓	1M using 8% 1CA (if 5% used)	(2)
	(b)	B = 5 512,50 x 1,05 ✓**OR** B = 5 512,50 + (5 515,50 x 0,05) ✓ = R5 788, 13 ✓ = 5 512,50 + 275,63 = R5 788,13 ✓	1M using 5% 1CA (if 8% used)	(2)
	(c)	C = 12 155,06 $(1 + 0,05)^5$ ✓ = 12 155,06 $(1,05)^5$ = 12 155,06 (1,276281563) ✓ = R15 513,28 ✓ **OR** C = $\frac{31\ 026,56}{2}$ ✓ ✓ = R15 513,28 ✓ **OR** C = 7 756,64 ✓ x 2 ✓ = R15 513,28 ✓	1F using compound formula 1S 1A 2M using correct value and / by 2 1A 2M using correct value and x by 2 1A	(3)
	(d)	D = 39 598,64 $(1 + 0,05)^5$ ✓ = 39 598,64 $(1,05)^5$ = 39 598,64 (1,276281563) ✓ = R50 539,01 ✓ **Accept 50 539,00** **OR** D = 25 269,50 ✓x 2 ✓ = R50 539,00 ✓	1F using compound formula 1S 1A 2M using correct value and x by 2 1A	(3)
1.1.2	The pay-out value of a child aged 14–21years is double ✓ the amount of a child aged 6–13 years, ✓and the payout value of a child aged 6–13 years is double the amount of a child aged 1–5 years. ✓		3A must refer to the comparison between the 3 age groups	(3)
1.1.3	The amounts increase because inflation increases every year. ✓✓ **Accept any other logical explanation.**		2A	(2)
1.1.4	**Accept any logical explanation.** ✓✓		2A	(2)

1.1.5	**Advantages:** • Plan will pay out to cover the cost of the funeral even if the amount of money paid into the plan is less than the pay-out amount. ✓✓ • Low monthly payments on the plan make it possible to put money aside. ✓✓ • **OR accept any logical explanation.** **Disadvantages:** • People can end up paying much more money into a funeral plan than is paid out to them. ✓✓ • No interest is earned on funeral plans (money does not grow). ✓✓ • **OR accept any logical explanation.**	2A Advantage 2A Disadvantage	(4)
1.2			
1.2.1	Due to inflation. ✓✓ Increase in government expenses. ✓✓ **Accept any logical explanation.**	2R	(2)
1.2.2	Annual salary = 15 800,75 x 12 = 189 609 ✓ **Income tax per month for 2014–2015 financial year** = R31 419 + (25% of amount above R174 550) ✓ = 189 609 – 174 550 = 15 059 x 0,25 = 3 764,75 + 31 419 = 35 183,75 ✓ – 12 726 ✓ = 22 457,75 / 12 ✓ = R1 871,48 ✓ **Income tax per month for 2015–2016 financial year** = R32 742 + 26% of the amount above R181 900 ✓ = 189 609 – 181 900 = 7 709 x 0.26 = 2 004,34 + 32 742 = 34 746, 34 – 13 257 = 21 489,34 / 12 = R1 790, 78 ✓ No, his statement is incorrect. ✓	1MA x12 1F Correct tax rate 1S 1M subtract rebate 1M divide by 12 1CA 1F Correct tax rate 1CA 1J	(9)
1.3			
1.3.1	25% ✓✓	2A	(2)
1.3.2	No. of people saving less than R25 = 0,25 x 140 ✓ = 35 people ✓	1M 1A	(2)
1.3.3	Inter-quartile = 65 – 25 ✓ = R40 ✓	1M 1A	(2)

1.3.4	The middle 50% ✓of people saving between R25 ✓and R65. ✓	3CA Must refer to middle 50% (1 mark) Must use between 25 and 65 (2 marks)	(3)
1.3.5	No. ✓ The highest value in the bottom 25% is only R25. ✓✓ **OR** The highest value of the bottom 50% is only R35. ✓✓ **OR** Only 25% of the people save more than R65. ✓✓	1A 2R	(3)
			[44]
QUESTION 2			
2.1			
2.1.1	Length = 6,7 cm ✓x 65 ✓ **OR** Length = 67 mm ✓ x 65 ✓ = $\frac{435\ cm}{100}$ = $\frac{4\ 355\ mm}{1\ 000}$ = 4,355 m ✓ = 4,355 m ✓ Breadth = 1,4 cm ✓x 65 **OR** Breadth = 14 mm ✓ x 65 = $\frac{91\ cm}{100}$ = $\frac{910\ mm}{1\ 000}$ = 0,91 m ✓ = 0,91 m ✓	1A measure length 1M x 65 1CA convert to m 1A measure breadth 1CA convert to m	(5)
2.1.2	$\boldsymbol{Area = Length\ x\ Breadth}$ = 4,355 m x 0,91 m ✓ = 3,96305 m^2 ✓ + (0,1 x 3,96305 m^2) ✓ = 3,96305 m^2 + 0,396305 m^2 = 4,359355 m^2 ✓ Labour cost = 55 ✓ x 3,96305 m^2 = R217,96775 = R217,97 ✓ Cost of tiles = 79,99 x 4,359355 m^2 = R348,7048065 = R348,70 ✓ Total cost of tiling = R217,97 + R348,70 = R566,67 ✓	1CA substitution in F as in 2.1.1 1CA as in 2.1.1 1CA 10% of area 1CA simplifying 1CA x 55 1CA labour cost 1CA cost of tiles 1CA	(8)

2.1.3	• Insert a window in the guest bedroom's en-suite. ✓✓ • Insert a window in the main bedroom's en-suite. ✓✓ • **OR accept any logical explanation.**	2A 2A	(4)
	•		
2.2			
2.2.1	Area of 1 shelf = $\frac{0{,}45\ m^2}{3}$ ✓ = 0,15 m^2 ✓ $\boldsymbol{Area = Length\ x\ Breadth}$ 0,15 m^2 = $\boldsymbol{Length}$ x 0,25 m ✓ $\boldsymbol{Length}$ = $\frac{0{,}15\ m^2}{0{,}25\ m}$ ✓ = 0,6 m x 100 = 60 cm ✓	1M divide area by 3 1A 1C convert to m 1M area of 1 shelf divided by 0,25 m 1CA	
	OR Area of one shelf in cm^2 = 0,45 x 10 000 = $\frac{4\ 500\ cm^2}{3}$ ✓ = 1 500 cm^2 ✓ Width of shelf in cm = $\frac{250}{10}$ = 25 cm ✓ Length of one shelf: $\boldsymbol{Area = Length\ x\ Breadth}$ 1 500 cm^2 = $\boldsymbol{Length}$ x 25 cm $\boldsymbol{Length}$ = $\frac{1\ 500\ cm^2}{25\ cm}$ ✓ = 60 cm ✓	1M divide area by 3 1A 1C convert to cm 1M area of 1 shelf divided by 25 cm 1CA	(5)
2.2.2	Number of books on shelf = $\frac{60\ cm}{2{,}3\ cm}$ ✓ = 26,086… ✓ = 26 books ✓ **OR** Number of books on shelf = $\frac{600\ mm}{23\ mm}$ ✓ = 26,086… ✓ = 26 books ✓	1M 1C convert mm to cm 1 R rounding 1M 1C convert cm to mm 1 R rounding	(3)
2.2.3	Number of books = $\frac{16\ kg}{1{,}493\ kg}$ ✓ = 10,716… = 10 books ✓ **OR** Number of books = $\frac{16\ 000\ g}{1\ 493\ g}$ ✓ = 10,716… = 10 books ✓	1M 1C convert g to kg 1R round down 1M 1C convert kg to g 1R round down	(3)

2.2.4	Height of shelf = 26,5 cm + 6 cm ✓ = 32,5 cm ✓ Height of book: $h^2 = o^2 + a^2$ $h^2 = 26{,}5^2 + 19{,}5^2$ ✓ = 702,25 + 380,25 ✓ = 1 082,5 h = $\sqrt{1{,}082{,}5}$ = 32,9 cm ✓ Explanation: The book is 0,4 cm (32,9 cm – 32,5 cm) longer than the height of the shelf therefore it cannot be placed in an upright position. ✓✓	2MA finding the height of the shelf 1SF correct substitution 1S simplifying of both squares 1MA finding the square root 2R Reason	(7)
			[35]
QUESTION 3			
3.1			
3.1.1	Loan Amount = Cash Price – Deposit + Once-off payment = 165 000 – 10 000 + 1 140 ✓ = 156 140 ✓	1M 1A	(2)
3.1.2	Total Amount = Deposit + (Monthly Repayments x number of months) = 10 000 + (3 122,49 x 72) ✓ = 10 000 + 224 819,28 ✓ = R234 819,28 ✓	1M 1S 1CA	(3)
3.1.3	Total Amount = (Monthly Repayments x number of months) + Balloon Payment = (2 921,08 x 72) + (0,25 x 165 000) ✓✓ = 210 317,76 + 41 250 ✓ = R251 567,76 ✓	2M 1S 1CA	(4)
3.1.4	Difference = 251 567,76 – 234 819,28 ✓ = R16 748,48 ✓	1CA 1CA if answers in 3.1.2 and 3.1.3 are used	(2)
3.1.5	Because of the value of the final amount at the end of the loan period. ✓✓ **Accept any logical explanation.**	2O Opinion	(2)
3.1.6	**<u>Option 1</u>** ✓ • The final payment is the same as all the monthly repayments throughout the period. ✓✓ • The total value is less. ✓✓ **Accept any logical explanation.**	1A Choice 4R 2 marks per reason No mark for choice only	

	OR **<u>Option 2</u>** ✓ • The monthly repayments is lower. ✓✓ • There is no deposit to be paid. ✓✓ **Accept any logical explanation.**	1A Choice 2R reason No mark for choice only	(5)
3.1.7	**<u>Disadvantages of Balloon Payment</u>** • Ownership of the car is only secured when final payment (balloon payment) is made. ✓✓ • Possibility that you do not have the final amount (balloon payment) to settle the loan. ✓✓ • Have to make another loan to settle the loan which will result into a person never get out of debt. ✓✓ **Accept any logical explanation.**	4A 2 marks per 1 disadvantage	(4)
3.2			
3.2.1	Yes, ✓ for Graph 1. ✓ No, ✓ for Graph 2 as the vertical axis starts at 10, which indicates that only 5 were sold in month 1 and 32 in month 6.✓	2A 2A	(4)
3.2.2	Graph 1 is the most appropriate graph. ✓✓	2A	(2)
3.3			
3.3.1	Number of cars in warehouse = 13 + 13 + 7 + 14 + 19 ✓ = 66 ✓	1M adding 1A	(2)
3.3.2	Hyundai i30 ✓ There is more in stock than the rest of the models. ✓✓	1A 2 R	(3)
3.3.3	P(Hyundai i30 black) = $\frac{5}{23}$ ✓ = 21,74% ✓ **(Accept 21,7%)**	1A Numerator and Denominator 1A in %	(2)
3.3.4	P(Hyundai i30 not black or blue) = $\frac{23}{23} - \left\{\frac{5}{23}\checkmark + \frac{6}{23}\right\}$ = $\frac{23}{23} - \frac{11}{23}\checkmark$ = $\frac{12}{23}$ = 0,52173913 = 0,522 ✓	1MA adding 1M subtraction 1A to 3 decimal places Answer only – full marks	(3)
3.3.5	7 Silver : 14 Black ✓ 1 : 2 ✓ Agree; For every silver Hyundai that is sold, 2 black Hyundais' are sold. ✓	1M 1A 1O	(3)
			[41]

QUESTION 4			
4.1			
4.1.1	Time to complete tour = $\frac{700\text{ km}}{80\text{ km/h}}$ ✓ = 8,75 h ✓ = 8h45min ✓	1M 1A Correct answer 1A correct hour and minutes	(3)
4.1.2	Time to start tour = 18h00 – 8h45m ✓ = 9h15 – 0h45 ✓ (30 min+ 15 min breaks) = 8h30 ✓	1M 1M subtracting 45 min 1CA depending on answer in 4.1.1	(3)
4.1.3	Number of litres for 700 km = $\frac{700\text{ km}}{7\text{ litres per km}}$ ✓ = 100 litres ✓ Grant needs 100 litres of petrol to cover a distance of 700 km. His tank therefore must be filled again with 40 liters to cover the rest of the distance. ✓✓ **OR** Distance covered = 60 x 7 ✓ = 420 km ✓ On the 60 litre tank only 420 km will be covered. The 280 km that is left, still need 40 liters. Therefore he must refill again to cover the total distance of 700 km. ✓✓	1M 1A 2 O 1M 1A 2O	(4)
4.1.4	East ✓ Smith Street is a one way street in an easterly direction. ✓✓	1A 2R	(3)
4.1.5	• Turn right into Rissik Street. ✓ • Turn left into Wolmarans Street. ✓ • Turn right into Bertha Street. ✓ • Follow Bertha Street; the Planetarium will be on the left. ✓ **OR** **Accept any other logical directions.**	4A Be aware of one way streets	(4)

4.2			
4.2.1	Braamfontein (mean) $= \frac{81 + 76 + 95 + 101 + 99 + 71 + 85 + 67 + 62}{9}$ ✓ ✓ $= \frac{737}{9}$ = 81,89 km/h ✓ Hillbrow (mean) $= \frac{62 + 83 + 73 + 77 + 96 + 99 + 76 + 68}{8}$ ✓ $= \frac{634}{8}$ = 79,25 km/h ✓ Yes, traffic officer's statement is correct, because Braamfontein's average is higher than Hillbrow's. ✓✓	1M adding 1M divide by 9 1A 1MA adding and divide by 8 1A 2O	(7)
4.2.2	No. ✓ There is no modal value in any of the data. ✓	1A 1R	(2)
4.2.3	Compound bar graph ✓✓	2A	(2)
4.2.4	8 ✓✓	2A	(2)
			[30]
		TOTAL:	**150**