Province of the
EASTERN CAPE
EDUCATION

NATIONAL SENIOR CERTIFICATE

GRADE 12

SEPTEMBER 2010

MATHEMATICAL LITERACY – SECOND PAPER

MEMORANDUM

This memorandum consists of 11 pages.

SYMBOL	EXPLANATION
A	Accuracy
CA	Consistent Accuracy
C	Conversion
J	Justification (Reason / Opinion)
M	Method
MA	Method with accuracy
R	Rounding off
RT/RG	Reading from Table / Reading from Graph
S	Simplification
SF	Correct substitution in a formula
O	Ordering data

Question 1

Question	Solution	Explanation	Tot	AS
1.1.1 a.	R 0,00 ✓ OR Nothing to pay✓	1A Solution	(1)	12.1.3
1.1.1. b.	Refer to 1st taxable bracket Amount Taxable: 125 786,00 – 100 000,00✓ = R 25 786,00✓ ∴ Tax due is 2% of R25 786,00 = 0,02× R25 786,00✓ = R515,72✓	1 Method 1 Answer 1 Substitution 1 A answer	(4)	12.1.3
1.1.1 c.	Refer to bottom last raw, i.e. when turnover is R800 000 Amount Taxable: = R800 000 – R750 000 = R50 000✓ ∴ Tax due is R25 750 + 7,5% of R50 000 ✓ = 25 750 + 0,075 × R50 000✓ = R29 500,00✓	1Method 1Method 1Answer 1Consistent Accuracy	(4)	12.1.3
1.1.1 d.	SARS tax calculations are progressive✓. Meaning the more a company makes money or individual earns, the more tax must be paid. ✓	2 Reason deduction	(2)	12.1.3 12.4.4 12.2.3
1.1.2	$i = \sqrt[n]{\frac{A}{P}} - 1$ $= \sqrt[6]{\frac{800000}{72500}}$ ✓✓- 1 = 1,49 – 1✓ = 0,492 ∴ 49,2%✓	2 Substitution 1 Simplification 1 Answer	(4)	12.1.1

(For any one sensible answer 2 marks)

Question	Solution	Explanation	Tot	AS
1.2.1	R 1,61 ✓✓	2RT Reading from table	(2)	12.2.3
1.2.2	Cost of one letter $= \frac{Total\ paid}{number\ of\ letters}$ $= \frac{R18,48}{8}$ ✓ $= = R2,31$ ✓ - from 30g up to and including 40g cost R2,31✓✓ or more than 30g up to 40 g	1 substitution 1 answer 2 Interpret graph	(4)	12.2.3 12.4.4
1.2.3	The cost start off at R1,26 ✓or 126^C and increase by 35^C ✓✓per interval.	3 Reason	(3)	12.2.3 12.2.1
1.2.4	- Cost of posting a 7g and 21g letter is R1,26✓ + R1,96 ✓= R3,22✓, - Cost of posting a 28g letter = R1,96✓. It is cheaper ✓to post or mail one envelope than two separate envelopes✓ of the same mass as one envelope.	2 calculation 2 reading from table 2 Reason deduction	(6)	12.1.1 12.1.3
			[30]	

Question 2

Question	Solution	Explanation	Tot	AS
2.1.1	$Base = \sqrt{(length\ of\ steps)^2 - (height)^2}$ $= \sqrt{1,3^2 - 1,2^2}$ ✓ $= \sqrt{0,25}$ ✓ = 0,5 m ✓	1A Substitution 1 simplification 1 answer	(3)	12.3.1
2.1.2	Base of slide = 2,1 – 0,5 ✓ = 1,6 m ✓	1 Method 1 Answer	(2)	12.3.1
2.1.3	$(Slide)^2 = (Base\ of\ slide)^2 + (height)^2$ $= 1,6^2 + 1,2^2$ ✓ = 4 ✓ $slide = \sqrt{4}$ ✓ = 2 m ✓	1 subst. 1 answer 1 metode 1 answer	(4)	12.3.1
2.1.4	$Distance = speed \times time$ 2 m = $speed \times$ 0,76 s ✓ $speed = \frac{2m}{0,76s}$ ✓ = 2,63 m/s ✓	1 SF 1 Simplification 1 answer	(3)	12.2.1
2.2.1	Eff sheet width = 925 mm – 10 % of 925✓ = 832,5 mm ✓ =0,8325 m ✓ Number sheets needed = $\frac{roof\ width}{sheet\ width}$ ✓ $= \frac{3,6}{0,8325}$ ✓ = 4,3… ✓ ≈ 5 ✓	1 metode 1 answer 1 conversion 1 metode 1 subst. 1 answer 1 rounded	(7)	12.1.2
2.2.2	Total surface area = $2 \times l \times h + 2 \times b \times h + l \times b$ - area of door ✓ ✓ ✓ ✓ $= 2 \times 3,6 \times 2,4 + 2 \times 3 \times 2,4 + 3,6 \times 3 - 3$ = 17,28 + 14,4 + 10,8 – 3 ✓ = 39,48 m^2 ✓	3 correct substitution 1 minus area of door & w 1 simplify 1 answer	(6)	12.2.2 12.2.3
2.2.3	Litres needed = $\frac{surface\ area}{spread\ area}$ ✓ $= \frac{39,48}{5}$ ✓ = 7,896 ℓ ✓ ∴ 2 coats = 7,896 ℓ × 2 = 15,792 ℓ ✓ ≈ 16 ℓ ✓	1 M 1 SF 1 answer 1 CA 1 rounded	(7)	12.2.3

	$4 \times 5\ \ell$ buckets $= 4 \times 143$ $= R\ 572$ ✓ or $3 \times 5\ \ell + 1\ \ell = 3 \times 143 + 35 = R464$ or $2 \times 5\ \ell + 6 \times 1\ \ell = R496$ $\therefore$ the cheapest is $3 \times 5\ \ell + 1\ \ell$ at R464 ✓ $\therefore$	1 M (2 marks can be awarded only for this step) 1 answer		
			[32]	

QUESTION 3

Q no	Solution	Explanation	Tot	AS
3.1.1	Ward 1: $7 - 3 = 4$ ✓; Ward 6: $27 - 16 = 8$ Ward 2: $18 - 8 = 10$; Ward 7: $11 - 8$ ✓ $= 3$ Ward 3: $10 - 7 = 3$; Ward 8: $24 - 16 = 8$ Ward 4: $28 - 18 = 10$; Ward 9: $23 - 25 = -2$ Ward 5: $33 - 20 = 13$; ✓ $\therefore$ Ward 5✓ showed the highest increase✓ in number of cricket players. [Answer only 5 marks]	3 subtraction 1 answer 1 reason	(5)	12.4.1 12.1.1
3.1.2	Ward 9. ✓	1 identifying	(1)	12.4.4
3.1.3	2006: mean $= \frac{121}{9} = 13,44 \approx 14$✓ 2007: mean $= \frac{142}{9} = 15,77 \approx 16$✓ 2008: mean $= \frac{173}{9} = 19,22 \approx 20$✓ 2009: mean $= \frac{181}{9} = 20,11 \approx 21$✓ $\therefore$ It shows a steady increase✓✓ in number of cricketers.	2 method 2 dividing 2 reason	(6)	12.4.3
3.1.4	Ward 3: ✓ $10 - 10 = 0$, there was no change between those years. ✓ Ward 5: ✓$33 - 33 = 0$, there was no change between those years. ✓	2 identify wards 1calculation 1 justifying	(4)	12.1.2
3.2.1	42 42,9 43 43 43,1 43,3 43,4 52 53,8 54,5 54,6 55,6 56,6 58,7 59,4 59,9 61,3 62,8 70,3 79 ✓✓ Median : $\frac{54,5 + 54,6}{2}$ ✓ $= 54,55$✓	2 order 1 calculation 1 answer	(4)	12.4.3

3.2.2	The median show that half ✓of the payers had a batting average above ✓ 54,55 and the other half had a batting average below ✓ 54,55	3 justifying	(3)	12.4.4
3.2.3	Lower quartile at 25% ∴ 75 % will have scores above 43,2 ✓	1 justifying	(1)	12.4.3
3.2.4	B = 42 ; N = 42,9 ; K = 43 ; Q = 43 ; M = 43,1 ✓✓	2 answer	(2)	12.4.4
3.3.1	R 170 637 – (R 34 000 + R 91 517) ✓ = R 45 120. ✓	1 calculation 1 answer	(2)	12.1.2 12.1.3
3.3.2	Registration fee✓. The greatest amount on income section is registration fee. ✓	1 answer 1 justifying	(2)	12.1.1 12.1.2
3.3.3	No. ✓Total income made was greater✓ than total expenses ✓made. Positive balance established. OR No. ✓ Income – Expenditure = R170 620 - R169✓ 920 = R700 ✓and it is a positive balance.	3 reason	(3)	12.1.3
3.3.4	Sum ✓of all registered players per ward is 173✓ according to statistics on table 4. The individual member paid $=\frac{Total\ registration\ fees}{total\ no.of\ players}$ ✓ $=\frac{R91517}{173}$ ✓ = R 529,00✓	1 method 1 answer 1 method 1 substitution 1 answer	(5)	12.1.1 12.1.2
			[38]	

Question 4

Question	Solution	Explanation	Tot	AS
4.1 (a)	No. ✓ An hour difference. ✓	1 answer 1 reason	(2)	12.2.3
4.1 (b)	04:00 ✓ and 08:00✓	2 answer	(2)	12.2.1
4.2	Average speed of Thabo's van = $\frac{dis\tan ce}{time}$ ✓ = $\frac{800}{8}$ ✓ = 100 km/h✓ Average speed of Tsietsi's car = $\frac{d}{t}$ = $\frac{840}{7}$ ✓✓ = 120 km/h ✓	1 change formula 1 SF 1 answer 1 time calculation 1 SF 1 answer	(6)	12.2.3 12.4.3
4.3	Annexure A		(8)	12.2.2
4.4	06:00 ✓ The two graphs intersect at that point ✓ ✓	1 answer 2 justify	(3)	12.2.3
4.5	Thabo : 12 km / 1 ℓ Tsietsi : 100 km with 12,5 ℓ $\therefore$ $\frac{100}{12,5}$ ✓= 8 km / ℓ ✓ $\therefore$ Tsietsi's✓ van used the most petrol ✓	1 metode 1 answer 2 justify	(4)	12.1.2
4.6	Starting in Jacobsdal they might not have been at the same location ✓✓ Or Tsietsi drove to another destination in Cape Town Or Tsietsi got lost and had to drive around to find the place Or any other reasonable explanation written out in a full sentence	2 reason	(2)	
			[27]	

Question 5

Question	Solution	Explanation	Tot	AS
5.1.1	9mm = 0,9cm ✓ $V_{(square\ biscuit)} = (6)^2 \times 0,9$✓ $= 36 \times 0,9$ $= 32,4\ cm^3$✓ $Volume_{(round\ biscuit)} = 3,14 \times (3$✓$)^2 \times 0,9$ $= 3,14 \times 9 \times 0,9$ $= 25,43cm^3$✓ ∴ Volume of a round biscuit is less by $32,4\ cm^3 - 25,43cm^3 = 6,97cm^3$✓	1 conversion 1 SF 1 answer 1 radius 1 SF 1 answer 1 answer	(7)	12.3.1
5.1.2	V of 100 square biscuits = 32,4 × 100 $= 3240\ cm^3$ ✓ $3240\ cm^3 = 3,24\ \ell$ ✓ ∴ 5 ℓ bowl would be the best, 20 ℓ is too big and the 1 ℓ too small ✓	1 answer 1 conversion 1 justify	(3)	12.3.2
5.1.3	$Number = \frac{250mm}{0,9mm}$ or $\frac{25cm}{0,9cm}$ ✓✓ = 27,78 ✓ ≈ 27 ✓	1 Metode 1 conversion 1 answer 1 rounding	(4)	12.3.2
5.1.4	No. ✓ The square biscuit packet will be shorter ✓ than that of round biscuit. They have a bigger volume and since they are made from the same ingredients, less biscuits will be in a packet and then the packet will be shorter. ✓ Or More round biscuit will be needed to give same mass packet as the square biscuit packet, because of smaller volume.	1 answer 2 explanation	(3)	12.3.3
5.2.1	The sale of round biscuits are increasing each week in a constant way, every week approximately the same number more. ✓✓	2 justify	(2)	12.4.4
5.2.2	They started slow but increased rapidly (8; 12; 18; 27; 41) ∴ ±60 ✓✓ (accept any reasonable increased value) only accept a decreased value if it is substantiated by a valid reason	2 prediction	(2)	12.4.4
5.2.3	Accept any valid reason like : - The Bakery should keep both type , both are increasing although round not by so much as square. Continue with the square biscuit it is more popular. 5 weeks is too early to make a conclusion, sales may drop the following week.	2 reason	(2)	12.4.4
			[23]	

NAME / EXAMINATION NUMBER:

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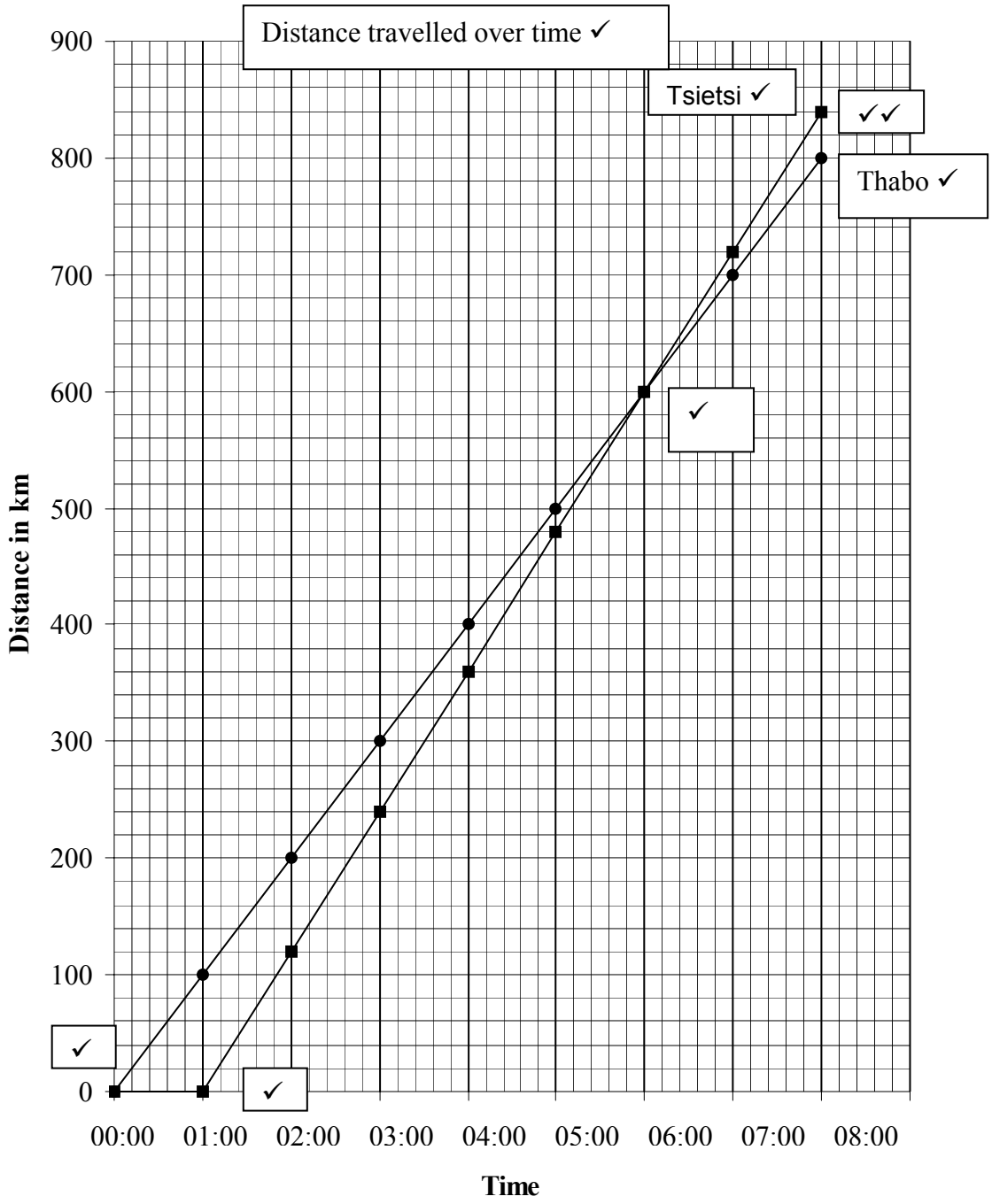
ANNEXURE A
QUESTION 4.3



MATHEMATICAL LITERACY PAPER 2 PREPARATORY EXAMINTION SEPTEMBER 2010

Item	Gr 12 ASs	LO1	LO2	LO3	LO4	L2	L3	L4	Sub Tot	Tot of Question
		25%	25%	25%	25%	20%	40%	40%		100%
1.1.1 a	1.3	1				1			1	
1.1.1 b	1.3	4					4		4	
1.1.1 c	1.3	4					4		4	
1.1.1 d	2.3		2					2	2	
1.1.2	1.3	4				4			4	
1.2.1	2.3		2			2			2	
1.2.2	2.3;4.4		2		2	2		2	4	
1.2.3	2.1		3					3	3	
1.2.4	2.3	4	2					6	6	**30**
2.1.1	3.1			3		3			3	
2.1.2	3.1			2		2			2	
2.1.3	3.1			4			4		4	
2.1.4	2.1		3			3			3	
2.2.1	1.1;1.2	7				0	7	0	7	
2.2.2	3.1			6		6			6	
2.2.3	1.3; 2.1	5	2				5	2	7	**32**
3.1.1	4.1				5	3		2	5	
3.1.2	4.4				1			1	1	
3.1.3	4.3				6	4		2	6	
3.1.4	4.4				4			4	4	
3.2.1	4.3				4		4		4	
3.2.2	4.4				3			3	3	
3.2.3	4.3				1			1	1	
3.2.4	4.4				2			2	2	
3.3.1	1.2;1.3	2					2		2	
3.3.2	1.2	2						2	2	
3.3.3	1.3	3						3	3	
3.3.4	1.2	5					5		5	**38**
4.1 (a)	2.3		2					2	2	
4.1 (b)	2.1		2				2		2	
4.2	2.3;4.3		4		2	4		2	6	
4.3	2.2		8			4	4		8	
4.3.1	2.3		3			1		2	3	
4.4	1.2	4					4		4	
4.5	3.1			2				2	2	**27**
5.1.1	3.1			7			6	1	7	
5.1.2	3.2			3		0	2	1	3	
5.1.3	1.2	1		2			3	0	3	
5.1.4	3.3			4		0		4	4	
5.2.1	4.4				2			2	2	
5.2.2	4.4				2			2	2	
5.2.3	4.4				2			2	2	**23**
		46	35	33	36	39	56	55	150	**150**
	Weight	**31%**	**23%**	**22%**	**24%**	**26%**	**37%**	**37%**	**100%**	