basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

MATHEMATICAL LITERACY P2

NOVEMBER 2014

MEMORANDUM

MARKS: 150

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
NPR	No penalty for rounding

This memorandum consists of 20 pages.

QUESTION 1 [38 MARKS]			
Ques	**Solution**	**Explanation**	
1.1.1	✓A The data is **discrete**, because the **violent incidents** is counted/whole numbers/integral values /categorised ✓O	1A correct type 1O reason (2)	L4
* 1.1.2	Total number of incidents involving boys = 13 + 12 + 18 + 11 + 10 + 16 = 80 ✓ S Total number of incidents involving girls = 7 + 3 + 4 + 7 + 5 + 19 ✓RG = 45 ✓ CA Difference = 80 – 45 = 35✓ CA **OR** Total for boys and girls = 20+15+22+18+15+35 = 125 ✓ S Total for boys = 13 + 12 + 18 + 11 + 10 + 16 = 80 ✓ S Number of girls = 125 – 80 = 45 ✓ CA Difference = 80 – 45 = 35 ✓ CA **OR** The total of the differences between boys and girls ✓ A ✓ A ✓ A = 6 + 9 + 14 + 4 + 5 – 3 = 35 ✓ CA	1S total number of boys 1RG reading from graph 1CA total number of girls 1CA difference **OR** 1S Total number of boys and girls 1S Total number of boys 1CA number of girls 1CA Difference **OR** 2A Positive differences 1A for negative 3 1CA the differences Max 2 marks if part data used Answer only full marks (4)	L3

*** This question must not be marked in Limpopo. The paper will be marked out of 143 and scaled and then the candidates' total mark will be up-scaled to 150 marks**

Ques	Solution	Explanation	
* 1.1.3	Cyber bullying ✓A Girls avoiding physical violence. ✓✓O **OR** Girls are afraid of confrontation and fighting ✓✓O **OR** ✓✓O Easier to express their emotions/feelings on social media	1A/RG reading from graph 2O explanation (3)	L3(1) L4(2)
1.2.1	Range = Highest value – Lowest value 5 = 18 – A ✓ M **A** = 13 ✓ CA **OR** A = 18 – 5 = 13 ✓M ✓ CA	1M concept of range 1CA value of A **OR** 1M concept of range using 5 1CA value of A Answer only full marks (2)	L2
1.2.2	Mean = $\frac{13+14\times4+15\times5+16\times10+17\times13+18\times7}{40}$ ✓ M ✓ A $=\frac{651}{40}$ ✓ CA = 16,275	**NB: Answer from Q 1.2.1** 1M adding all 40 values 1A dividing by 40 1CA Simplification NPR Answer only full marks (3)	L2

*** This question must not be marked in Limpopo. The paper will be marked out of 143 and scaled and then the candidates' total mark will be up-scaled to 150 marks**

Ques	Solution	Explanation	
1.2.3	**B** = $\frac{15+16}{2}$ ✓A = 15,5 ✓CA **C** = $\frac{16+17}{2}$ ✓M = 16,5 ✓CA **D** = 17 ✓CA	1A identifying the correct values 1 CA value of B [If only B = 15 then one mark and If answer only B=23 then one mark] 1 M concept of median 1 CA value of C 1 CA value of D Answer Only full marks (5)	L2
1.2.4	P = $\frac{30}{40}$ ✓A ✓A = 0,75 ✓CA	1A 30 grade 9 boys 1A no. of boys 40 1CA decimal Answer Only full marks (3)	L2
1.2.5	The grade 9 boys are too old for their grade. ✓✓J **OR** Social: ✓✓J Need recognition / low self- esteem / identity crisis. **OR** Economic: To gain favours from others. ✓✓J **OR** Educational: They are frustrated by their lack of progress. ✓✓J **OR** Environmental factors/ emotional factors ✓✓J **OR** ✓✓J Contextual factors/ No parental control/Peer pressure **OR** ✓✓J Violent community / child headed family/gang related	2J reason (2)	L4

Ques	Solution	Explanation	
1.3.1	Total cost in Rand ✓A ✓A ✓A = 300 for the first 15 passengers + 50 × the number of persons more than 15 ✓A **OR** Total cost (in Rand) ✓A ✓A ✓A ✓A = 300 + (the number of persons – 15) ×50 **OR** Total cost (in Rand) ✓A ✓A ✓A = 300 + (*n* – 15 persons) ×50 ✓A Where *n* is the number of persons more than 15 **OR** Total cost (in Rand) ✓A ✓A = (number of persons)× 50 – 450 ✓✓A	1A constant cost 1A 15 persons 1A number of persons more than 15 1A multiply by the rate R50 **OR** 1A constant cost 1A using 15 persons 1A using a variable with explanation 1A multiply by the rate R50 **OR** 1A constant cost 1A using 15 persons 1A using a variable with explanation 1A multiply by the rate R50 **OR** 2A – 450 1A number of persons 1A multiply by the rate R50 (4)	
1.3.2 (a)	✓SF 900 = 300 + (*n* – 15 persons) ×50 (*n* – 15 persons) ×50 = 600 *n* – 15 persons = 12 *n* = 27 ✓A **OR** 27 ✓✓RT	1SF Substituting in formula 1A Maximum number **OR** 2 RT Max number of passengers [Both 25 and 27 one mark and 25 only, no marks] (2)	L3

Ques	Solution	Explanation	
1.3.2 (b)	10 learners + 1 teacher 10 learners + 1 teacher ✓✓MA 4 learners + 1 teacher ∴ 24 learners and 3 teachers ✓A 24 : 3 ✓CA = 8: 1 ✓CA **OR** 1 educator for 10 learners ✓ MA $\therefore \frac{1}{11} \times 27 = 2{,}454545...$ teachers ✓ CA ∴ 3 teachers ✓ R And 24 learners 24 : 3 ✓ CA 8: 1 ✓ CA	**NB:** Use CA from Q1.3.2(a) 2MA working with ratio 1A Number of teachers 1CA ratio in correct order 1CA simplified ratio **OR** 1MA working with ratio 1CA number of teachers 1R Rounding up 1CA ratio in correct order 1CA simplified ratio (5)	L3
1.3.3	There is only one double six. ✓ A There is 6 combinations of seven. ✓ A ∴ Mr Boitumelo has a larger probability than Miss Ansie to accompany the learners. ✓ O **OR** ✓ A $P_{(\text{double six})} = \frac{1}{36} \approx 2{,}8\%$ $P_{(\text{seven})} = \frac{6}{36} = \frac{1}{6} \approx 16{,}7\%$ ✓ A ∴ Mr Boitumelo has a larger probability than Miss Ansie to accompany the learners. ✓ O	1A probability of double six 1A probability of seven 1O explanation **OR** 1A probability of double six 1A probability of seven 1O explanation (3)	L4
		[38]	

QUESTION 2 [33MARKS]			
Ques	**Solution**	**Explanation**	
2.1.1	Volume of petrol = $\frac{\text{R500}}{\text{R14,04}}$ litre ✓ M = 35,61253561 litre ✓ A <u>Distance each model can travel with 35,613 ℓ of petrol:</u> **Sonic 1.6 :** $\frac{35,613}{6,7} \times 100 \text{ km} \approx 531,54 \text{ km}$ ✓ CA **Aveo 1.6 :** $\frac{35,613}{7,3} \times 100 \text{ km} \approx 487,85 \text{ km}$ ✓ CA ∴ **Sonic 1.6** will travel a greater distance. ✓ ✓O **OR** ✓ M Volume of petrol = $\frac{\text{R500}}{\text{R14,04}/\ell} = 35,613\ \ell$ ✓ A <u>Finding distance using consumption rate for each model:</u> Sonic rate = $\frac{100\,\text{km}}{6,7\ell} = 14,925 \text{ km}/\ell$ Distance = 14,925 km/ℓ × 35,613 ≈ 531,5 km ✓ CA Aveo rate = $\frac{100\,\text{km}}{7,3\ell} = 13,70 \text{ km}/\ell$ Distance = 13,70 km/ℓ × 35,613 ≈ 487,9 km ✓ CA ∴ **Sonic 1.6** will travel a greater distance. ✓ ✓O	1M dividing by R14,04/ ℓ 1A volume 1CA distance 1CA distance 2O conclusion **OR** 1M dividing by R14,04/ ℓ 1A volume 1CA distance 1CA distance 2O conclusion [Correct conclusion only 2 marks] (6)	L3

Ques	Solution	Explanation	
2.1.2	Number of stops and the length of stopping while the engine is running. ✓ O **OR** The driving pattern of the driver for example fast acceleration and hard breaking. ✓ O **OR** ✓ O Driving at high speeds with open windows **OR** Use of the air conditioner. ✓ O **OR** The condition of the car with relation to tyre pressure, load, etc. ✓ O **OR** ✓ O Condition of the road surface, and the slope of the road. ✓ O **OR** Mechanical fault / condition / Electronic damage **OR** Load and number of passengers in vehicle ✓ O **OR** Traffic congestion ✓ O	1O any FIRST correct factor 1O for any SECOND correct factor (2)	L4
2.1.3	**Sonic** Monthly petrol cost (in Rand) ✓M ✓A ✓MA $= \frac{35\,000}{12} \times 14{,}04 \times \frac{6{,}7}{100} = 2\,743{,}65$ ✓CA Total running cost(in Rand) = 2 743,65 + 2 657,00 = 5 400,65 ✓CA **Aveo** Monthly petrol cost (in Rand) $= \frac{35\,000}{12} \times 14{,}04 \times \frac{7{,}3}{100} = 2\,989{,}35$ ✓CA Total running cost(in Rand) = 2 989,35 + 1 942,00 = 4 931,35 ✓CA ∴ **Aveo 1.6** is more economical. ✓ O **OR**	1M dividing by 12 1A multiply petrol price 1MA multiply by consumption rate 1 CA petrol cost Sonic 1CAtotal running cost for the Sonic 1 CA petrol cost Aveo 1CA total running cost for the Aveo 1O conclusion [3 out of 8 marks if petrol cost ignored]	

Ques	Solution	Explanation	
2.1.3 Cont.	**Sonic 1.6** Instalment cost per year = 12 × R 2 657 ✓M = R 31 884 Petrol cost per year = 35 000 km $\times \frac{6{,}7\ell}{100\,\text{km}}$ × R14,04/ ℓ ✓MA ✓A = 2 345 × R14,04 = R 32 923,80 ✓CA Total running cost for the year = monthly instalments for 12 months + petrol cost per year = R 31 884 + R 32 923,80 =R 64 807,80 ✓CA **Aveo 1.6** Instalment cost per year = 12 × R 1 942 = R 23 304 Petrol cost per year = 35 000 km $\times \frac{7{,}3\ell}{100\,\text{km}}$ × R14,04/ ℓ = 2 555 × R14,04 = R 35 872,20 ✓CA Total running cost per year = monthly instalments for 12 months + petrol cost per year = R 23 304 + R 35 871,20 =R 59 176,20 ✓CA The Aveo 1.6 is more economical. ✓O	1M multiplying by 12 1MA multiply by consumption rate 1A multiply petrol price 1CA petrol cost Sonic 1CA total running cost for the Sonic 1 CA petrol cost Aveo 1CA total running cost for the Aveo 1O conclusion	L4
	✓MA **OR** R14,04 / ℓ × 6,7 = R94,068 ✓A Sonic: R94,068 : 100 x : 35 000 ∴ x = R32 923,80 ✓CA Total running cost = R32 923,80 + 12 × R2 657 ✓M = R64 807,80 ✓CA Aveo : R14,04 / ℓ × 7,3 = R102,492 R102,492 : 100 y : 35 000 ∴ y = R35 872,20 ✓CA Total running cost = R35 872,2 + 12 × R1 942 = R59 176,20 ✓CA ∴ Aveo 1.6 is more economical. ✓O	**OR** 1MA multiply by consumption rate 1A multiply petrol price 1 CA petrol cost Sonic 1M multiplying by 12 1CAtotal running cost for the Sonic 1 CA petrol cost Aveo 1CA total running cost for the Aveo 1O conclusion (8)	

Ques	Solution	Explanation	
2.2.1	Age 6 to 7 years. ✓✓ RG	2RG the age [6 or 7 one mark] [Including other intersection points **ONLY** one mark] (2)	L2
2.2.2	Growth is a continuous phenomenon. ✓ O **OR** Growth is affected by many factors like nutrition and health. ✓ O **OR** ✓ O It is influenced by genetic makeup inherited from parents. **OR** This graph is for average heights. ✓ O **OR** Physical disabilities will influence height ✓ O	1O any FIRST correct reason 1O for any SECOND correct reason (2)	L4
2.2.3	Between 4 and 6 years ✓RG Between 11 and 14 years ✓RG	1RG reading from graph 1RG reading from graph [5 and 13 only one mark] (2)	L2
2.2.4	**Boys stay longer** than girls in childhood. ✓✓RG **Both** girls and boys **remain the same** in pre-adolescence. ✓RG **Girls stay longer** in adolescence. ✓✓RG **OR**	2RG comparing childhood stage 1RG comparing pre-adolescence 2RG comparing adolescence **OR**	L4

Ques	Solution	Explanation	
2.2.4 Cont.	**Childhood** Girls stay in childhood stage: 7 years ✓✓RG Boys stay in childhood stage: 9 years **Pre-adolescence** Girls stay in pre-adolescent stage: 2 years Boys stay in pre-adolescent stage: 2 years ✓RG **Adolescence** Girls stay in adolescent stage: 6 years Boys stay in adolescent stage: 4 years ✓✓RG	2RG number of years in childhood 1RG number of years in pre-adolescence 2RG number of years in adolescence (5)	
2.2.5	The girls' height slows down/stabilizes/levels/evens out. ✓✓O **OR** ✓✓O The girls' growth rate relating to height decreases.	2O trend **[0 marks or 2 marks]** **[Trend relating to girls only]** (2)	L4
2.2.6	Height in inches = 165 × 0,3937 ✓C = 64,9605 ✓ A ✓✓ CA The boy's height is **above the average height** for boys **OR** Height in cm $= \frac{63}{0,3937}$ ✓C = 160,02 ✓ A ✓✓ CA The boy's height is **above the average height** for boys	1C conversion 1A accuracy 2CA conclusion [Range 62 to 65] **OR** 1C conversion 1A accuracy 2CA conclusion [Range 157 to 165] (4)	L3
		[33]	

QUESTION 3 [34 MARKS]			
Ques	**Solution**	**Explanation**	
3.1.1	**Note: Afrikaans scripts to be marked differently** Annual salary = R 20 416,67 × 12 = R 245 000,04 ✓ MA Pension = R 245 000,04 × 6 % = R 14 700 ,00 ✓ CA Taxable amount without bonus = R 245 000,04 – R 14 700,00 = R 230 300, 04 ✓ CA Taxable annual income ✓ CA = R230 300,04 + R20 416,67 = R250 716,71 **OR** Monthly pension = R20 416,67 × 6% = R1 225 ✓ MA Monthly taxable salary = R20 416,67 – R1 225 = R19 191,67 ✓ CA ✓ MA Annual taxable income = R19 191,67 × 12 + R20 416,67 = R250 716,71 ✓ CA **OR** Annual taxable income ✓ MA ✓ MA = (13 × R 20 416,67) – (12 × R 20 416,67 × 6%) = R 265 416,71 – R14 700 ✓ CA = R250 716,71 ✓ CA	1MA annual salary 1CA pension 1CA subtracting the pension 1 CA taxable annual income **OR** 1MA pension 1CA subtracting the pension 1MA annual salary 1 CA taxable annual income **OR** 1MA multiplying by 13 1MA calculating the pension 1CA subtracting the pension 1 CA taxable annual income [Pension omitted lose 2 marks] [Bonus omitted lose 1 mark] (4)	L3
3.1.2	✓ A ✓ SF Rate of tax = R 29 808 + 25% × (R250 716,71 – R 165 600) = R 29 808 + R 85 116,71 × 25% = R 29 808 + R 21 279,18 = R 51 087,18 ✓ CA ✓ S Annual tax after rebate = R 51 087,18 – R 12 080,00 = R 39 007,18 ✓ CA	NB: Amount from Q3.1.1 1A for correct tax bracket 1SF for substituting into the formula 1S simplification 1CA for tax amount 1CA for tax amount after rebate NPR (5)	L3

Ques	Solution	Explanation	
3.1.3	✓ CA Monthly Tax = R 39 007,18 ÷ 12 = R 3 250,60 Net monthly salary = Monthly salary – pension – monthly tax ✓ M = R 20 416,67 – R 1 225 – R 3 250,60 = R 15 941,07 ✓ CA **OR** Annual salary after tax = Annual salary – pension – annual tax ✓ M = R245 000,04 – R 14 700,00 – 39 007,18 = R 191 292,86 ✓ CA ∴ Net monthly salary = $\frac{R191292,86}{12}$ = R15 941 ,07 ✓ CA	1CA for tax value per month 1M for subtracting both values 1CA net salary [CA only if a monthly salary is used] **OR** 1M for subtracting both values 1CA annual salary 1CA monthly salary [dividing by 12] (3)	L3
3.2.1	Amount if inflation rate was used for increase ✓ A ✓ M = R44,8 billion × 105,77% = R47,38496 billion ✓ CA ✓ M This amount is less than the amount which was allocated, therefore her claim was valid. ✓ O **OR** Amount if inflation rate was used for increase ✓ A ✓ M = R44 800 000 000 × 105,77% = R47 384 960 000 ✓ CA ✓ M This amount is less than the amount which was allocated, therefore her claim was valid. ✓ O **OR**	1A correct amount from table 1M percentage increase 1CA increased amount 1M comparing 1O stating that she is correct **OR** 1A correct amount from table 1M percentage increase 1CA increased amount 1M comparing 1O stating that she is correct **OR**	L3(4) L4(1)

Ques	Solution	Explanation	
3.2.1 Cont.	Difference = R47,9 billion – R44,8 billion ✓ A = R3,1 billion ✓ M Percentage increase $= \frac{\text{R3,1 billion}}{\text{R44,8 billion}} \times 100\%$ ✓ MA = 6,919642857 % ≈ 6,9% ✓ CA Her claim is valid. ✓ O **Note** [Word billion must be there when subtracting and not for %]	1A correct amount from table 1M subtracting correct values 1MA calculating the percentage increase 1CA for rounding off 1O stating that she is correct (5)	
3.2.2	Department of National Defence percentage growth from 2013/14 to 2014/15 is 6,9% ✓ CA South African national budget percentage growth from 2013/14 to 2014/15 ✓ M/A $= \frac{\text{R1,25 trillion} - \text{R1,15 trillion}}{\text{R1,15 trillion}} \times 100\%$ ✓M = 8,69565174 % ✓ CA Dr Khoza's statement **is correct**.✓O	* CA from Q3.2.1 1CA correct percentage 1M/A using correct values 1M calculating growth 1CA calculating average % 1O Stating that the increase is greater (5)	L3(3) L4(2)
3.2.3	Amount 2013/14 = 8,1% × R 41,6 billion + R41,6 billion ✓ M = R3,3639 billion + 41,6 billion = R44,9696 billion ✓ CA Amount 2014/15 = 5,9% × R 44,9696 billion + R44,9696 billion = R2,6532064 billion + 44,9696 billion ✓ M = R 47,6228064 billion ✓ CA **OR** ✓ M ✓ CA Actual amount = R 41,6 billion × 108,1% = R 44,9696 billion ✓ M ✓ CA R 44,969 6 billion × 105,9% = R 47,622 806 4 billion or R47 622 806 400	1M for increasing by 8,1% 1CA the amount 1M for increasing by 5,9% 1CA the amount **OR** 1M for increasing by 8,1% 1CA the amount 1M for increasing by 5,9% 1CA the amount NPR [Penalty 1 mark if billions omitted] (4)	L3

Ques	Solution	Explanation	
3.2.4	Difference =R48 billion - R47,9 billion = R 0,1 billion. ✓ O In reality the difference is not 0,1 but an amount of R100 000 000 (one hundred million) ✓ O **Example:** R 47,9 billion rounded R48 billion implies that there will be an over allocation of R100 million ✓ O	1O for identifying the difference of 0,1 1O For knowing that 0,1 billion is 100 000 000 1O suitable example must be chosen (3)	L4
3.3.1	A visual representation is more understandable (make sense of) for the general public than a table with values only. ✓✓ O **OR** A visual representation is easier to read than text or table consisting of values. ✓✓ O **OR** The actual values are in billions and trillions which many people don't understand, where in these graphs percentages are used which are more understandable. ✓✓ O	2O reason (2)	L4
3.3.2	✓ O A bar graph (multiple/compound) is more appropriate to display this data The bar graph will allow for a much more-in-depth analysis of the ✓✓ O trends in the collection of tax between the different categories over a period of time. **OR** Line or broken line graph ✓ O The two lines will allow for a much more-in-depth analysis of the trends in the collection of tax between the different categories over a period of time. ✓✓ O	1O identifying the type of graph 2O for explaining the advantage of a bar graph **OR** 1O identifying the type of graph 2O for explaining the advantage of a broken line graph (3)	L4
		[34]	

QUESTION 4 [45 marks]			
Ques	**Solution**	**Explanation**	
4.1.1(a)	✓A ✓A ✓CA M15 and M16	1A correct row number 1A seat number 1CA second seat number [15 and 16 two marks] (3)	L2
4.1.1(b)	✓A ✓A 24 × 2 = 48 seats	1A 24 seats 1A total number of seats (2)	L2
4.1.1(c)	✓RT ✓MA ✓RT Total income in OR = (72×78) + (388 × 48) +(83 × 42) + (81 × 28) + (112 × 15) + (82 × 10) ✓S ✓RT = 5 616 +18 624 + 3 486 +2 268 +1 680 + 820 = 32 494 ✓CA	* seats from Q 4.1.1 (b) 1MA adding the values 1RT cost zone A and B 1RT cost for zone C and D 1RT cost for zone E and F 1S simplification 1CA answer [One mark for every 2 zones] (6)	L3
4.1.2(a)	Cost for 1 zone B ticket = 48 OR ✓A = R27, 2183 × 48 = R 1 306,48 ✓C Cost in Euro for one flight ticket = 492, 29 Cost in OR for one flight ticket = $\frac{492,29}{1,87126}$ ✓M = 263,08 Cost in Rand for one flight ticket = 263,08 × R 27, 2183 ✓M = 7 160, 59 ✓CA Total cost per person = R 1 306,48 + R 7 160, 59 = R 8 467,07 ✓CA Total cost for two = R 8 467,07 × 2 = R 16 934,14 ✓CA **OR**	1A cost of ticket 1C convert OR to Rand 1M convert Euro to OR 1M convert OR to Rand 1CA cost of one ticket 1CA calculating total cost per person 1CA calculating total cost for two people **OR**	L4

Ques	Solution	Explanation	
4.1.2(a) (cont.)	✓A Cost for 2 zone B tickets = 2 × 48 OR = 96 OR = R27, 2183 × 96 = R2 612, 96 ✓C Cost for 2 flight tickets = 2 × €492, 29 = €984, 58 ✓A €984, 58 = $\frac{R27,2183 \times 984,58}{1,87126}$ ✓✓M = R14 321, 15 ✓CA Total cost = R2 612, 96 + R14 321, 15 = R16 934, 11 ✓CA **OR** ✓A Cost for Zone B tickets: 2 × 48 OR = 96 OR ✓A Flight tickets in OR = $\frac{2 \times 492,29}{1,87126}$ ✓C = 526,1588448 ✓CA Total cost: 526,1588448 + 96 = 622,1588448 ✓CA Cost in Rand = 622,1588448 × 27,2183 ✓C = 16 934,11 ✓CA	1A cost for one ticket 1C conversion 1A 2 flight tickets 2M convert Euro to rand 1CA cost of 2 tickets in rand 1CA total cost **OR** 1A cost for one ticket 1A cost of 2 tickets 1C conversion to OR 1CA ticket price 1CA total cost 1C convert OR to Rand 1CA cost in rand (7)	
4.1.2(b)	Time leaving Johannesburg + flight time = 20h30 +11h25 = 31h55 ✓A ✓CA Time in South Africa when they arrived: 07:55 or 7.55 am or five minutes to eight in the morning	1A adding 1CA correct time [If written as 07h55 one mark only] Answer only full marks (2)	L2
4.2.1	South westerly (SW) ✓✓A **OR** South, south westerly (SSW)	2A correct direction (2)	L2

Ques	Solution	Explanation	
4.2.2	This chart only shows distances from Muscat. ✓✓O OR ✓✓O They don't lie in the same direction. ✓✓O OR This is not a map / strip chart.	2O opinion (2)	L4
4.2.3	Muscat to Sydney ≈ 3 349km × 3,5 ✓RT ✓M ≈ 10 716,8 to 11 721, 5km ✓CA	1RT correct value 1M multiplication by 3 349 1CA correct distance [Range of values 3,2 to 3,5] [3 or 4 then max 2 marks] (3)	L2
4.3.1	TSA = P × H + K ✓A ✓SF = 8 × 110 mm × 250 mm + 58 423 mm^2 = 220 000 mm^2 + 58 423 mm^2 = 278 423mm^2 ✓S = 0,278 423 m^2 ✓C For 0,07 m^2 one needs 100mℓ of paint ∴ 1 m^2 one need $\frac{100}{0,07}$ mℓ ✓M = 1 428,57 mℓ ∴ 0,278423 m^2 need = 1428,571429 × 0,278423 = 397,7471429 mℓ ≈ 397,75 mℓ ✓CA Two coats = 2 × 397, 75mℓ = 795, 49 mℓ ✓CA Number of spray cans = $\frac{795,49\,m\ell}{250\,m\ell}$ = 3,18184 ≈4 ✓CA	1A total area of panels 1SF substitution in formula 1S simplification 1C conversion to m^2 1M Method 1CA paint needed for 1 coat 1CA paint needed for 2 coats 1CA rounding up	L4

4.3.1 Cont.	**OR** TSA = P × H + K ✓A ✓C ✓SF = 8 × 0,110 m× 0,250m + 0,058 423 m^2 = 0,22 m^2+ 0,058 423 m^2 = 0,278 423 m^2 ✓S For 0,07 m^2 one needs 100mℓ of paint ∴ 1 m^2 one need $\frac{100}{0,07}$ mℓ ✓M = 1 428,57 mℓ ∴ 0,278423 m^2 need = 1428,571429 × 0,278423 = 397,7471429 mℓ ≈ 397,75 mℓ ✓CA Two coats = 2 × 397, 75mℓ = 795, 49 mℓ ✓CA Number of spray cans = $\frac{795,49\,m\ell}{250\,m\ell}$ = 3,1819 ≈4 ✓CA **OR** TSA = P × H + K ✓A ✓C ✓SF = 8 × 0,110 m× 0,250m + 0,058 423 m^2 = 0,22 m^2+ 0,058 423 m^2 = 0,278 423 m^2 ✓S ✓A 1 spray can covers = 0,07 × 2,5m^2 = 0,175 ✓CA Number of cans = $\frac{0,2784823}{0,175}$ ×2 ✓M = 3,1819 ≈4 ✓CA	**OR** 1A total area of panels 1C conversion to m^2 1SF substitution in formula 1S simplification 1M method 1CA paint needed for 1 coat 1CA paint needed for 2 coats 1CA rounding up **OR** 1A total area of panels 1C conversion to m^2 1SF substitution in formula 1S simplifying 1A spray rate per can 1CA simplification 1M for two coats 1CA rounding up	L4

Ques	Solution	Explanation	
4.3.1 cont.	**OR** TSA = P × H + K ✓A ✓SF = 8 × 110mm × 250mm + 0,058423m^2 = 8 × 0,11m × 0, 25m + 0,05423m^2 ✓C = 0,22 m^2 + 0,058423m^2 = 0,278423m^2 ✓S 100 m*l* covers 0,07 m^2 $\therefore$ 0,28m^2 will need = $\frac{100\times 0,278423}{0,07}$mℓ ✓M = 397,7471429mℓ = 397,75mℓ ✓CA Two coats = 2 × 397, 75mℓ = 795, 49 mℓ ✓CA Number of spray cans = $\frac{795,49\,\text{m}\ell}{250\,\text{m}\ell}=3,181\approx 4$ ✓CA	**OR** 1A total area of panels 1SF substitution in formula 1C conversion to m^2 1S simplification 1M method 1CA paint needed for 1 coat 1CA paint needed for 2 coats 1CA rounding up (8)	
4.3.2	✓MA Height = 240 mm × 164 = 39 360 mm ✓CA = 39, 36 meters ✓C $\therefore$ The height of the actual tower is approximately 39, 4m **OR** ✓MA ✓C Height = 25cm – 1cm = 24 cm = 0,24 m Actual height = 0,24 × 164 = 39,36 m ✓CA	1MA correct height 1CA correct answer in mm 1C conversion **OR** 1MA correct height 1C conversion 1CA correct answer in m **NPR** (3)	L2
4.4	✓A 1. **Mount** the vertical poles to the kick base and **fasten** with the screws. ✓A ✓A 2. **Slide** the three glass panels into the vertical poles. ✓A 3. **Place** the top aluminium frame on top and **fasten** with screws. ✓A ✓A 4. **Screw** the interior standards onto the aluminium framing and **insert** the brackets. ✓A	1A for the vertical poles 1A for the screws 1A glass panels 1A for the top frame 1A Screws 1A interior standards 1A brackets [Single word answers not acceptable.] (7)	L2
		[45]	

TOTAL: 150