Education and Sport Development

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NORTH WEST PROVINCE

NATIONAL SENIOR CERTIFICATE

GRADE 12

MATHEMATICAL LITERACY PAPER 2

JUNE 2018

MEMORANDUM

MARKS: 100

SYMBOL	EXPLANATION
M	Method
M/A	Method with accuracy
CA	Consistent accuracy
A	Accuracy
C	Conversion
D	Definition
S	Simplification
RT/RG /RD	Reading from a table/Reading from a graph /diagram
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
J	Justification/Reason
NP	No penalty for rounding OR omitting units
AO	Answer only full marks

This marking guideline consists of 7 pages

KEY TO TOPIC SYMBOL:
F = Finance; M = Measurement; MP = Maps, plans and other representations; D = Data Handling
P = Probability.

QUESTION 1 [32]

Ques	Solution	Explanation	T & L
1.1.1	Monthly salary = R410 530 ÷ 12✓ = R34 210,83✓ Salary band for both options is R22 037,01 and above✓	1M dividing by 12 1A answer 1A correct salary band for both (3)	**F** **L2**

1.1.2	Emerald = R3 081 + R2 305 + 2 × R1 145
	        = R7 676✓
	Emerald value = R6 779✓
	Difference = R7 676 – R6 779✓
	        = R897✓
		CA from 1.1.1
		2RT identifying R7 676 and R6 779
		1M subtraction
		1CA answer
		(4)
			F
			L2

1.1.3	$\% = \dfrac{3\ 861}{6\ 779}$ ✓$\times 100\%$
	    = 56,95…..%✓
	    ≈ 57%✓
		1RT correct values
		
		1CA answer
		1CA answer rounded to nearest whole number
		(3)
			F
			L2

1.1.4	It is important for people to be healthy✓✓
	            OR
	For employees' well being✓✓
	            OR
	Any other relevant reason
		2O importance
		
		(2)
			M
			L4

1.2.1	Medical aid credits = (R303 × 2) + (R204 × 2)✓
	                = 1 014 × 12✓
	                = R12 168✓
		1MA multiplying and adding
		1CA answer multiplied by 12
		1CA answer
		(3)
			F
			L2

1.2.2	Taxable income = R410 530 Annual tax before rebate =R63 853 + 31% of income above R305 850✓ = R63 853 + 31% (R410 530 ✓– R305 850) =R96 303,80✓ Tax rebate and medical credits R96 303,80 – R13 635 – R12 168 ✓ = R70 500,80 Monthly tax payable = R70 500,80 ÷ 12✓ = R5 875,07✓ Abe's claim is not valid. His tax is less by R413,57✓	1A correct tax bracket 1MCA amount above 1CA answer 1M subtracting rebate and medical credits 1M dividing by 12 1CA monthly tax 1J justification (7)	**F** **L4**
1.2.3	Both reduces the amount of tax payable **OR** Any other relevant answer.	2A Explanation (2)	**F** **L4**

1.3	End of yr 1 = R34 210 + (34 210 × 5,5%)✓ 　　　　　 = R36 091,55✓ End of yr 2 = R36 091,55 + (R36 091,55 × 7,1%)✓ 　　　　　 = R38 654,05✓ **OR** End of year 1 = R34 210 × 5,5% 　　　　　　 = R1 881,55✓ 　　　　　　 = R34 210 + R1 881,55 　　　　　　 = R36 091,55✓ End of year 2 = R36 091,55 × 7,1% 　　　　　　 = R2 562,50✓ 　　　　　　 = R36 091,55 + R2 562,50 　　　　　　 = R38 654,05✓ **OR** End of year 1 = R34 210 × 105,5%✓ 　　　　　　 = R R36 091,55✓ End of year 2 = R36 091,55 × 107,1%✓ 　　　　　　 = R38 654,05✓ **OR** Amount at end of year 2 = R34210 × 105,5% ✓× 107,1%✓✓ = R38 654,05✓	1M multiplying correct values 1CA amount for year 1 1M multiplying correct% and value 1CA amount for year 2 **OR** 1M calculating 5,5% 1CA amount for year 1 1M calculating 7,1% of year 1 1CA amount for year 2 **OR** 1M multiplying and adding % 1CA amount for year 1 1M multiplying and adding correct % to year 1 amount **OR** 1M adding percentages 1M multiplying correct numbers 1M mult by 105,5% and 107,1% 1CA amount for year 2　　　　　(4)	**F** **L3**
1.4	Height in inches = 6 × 12 + 4✓ 　　　　　 = 76✓ BMI (in kg/m²) = $\dfrac{200}{76 \times 76} \times 703$✓ 　　　　　 = 24,3✓	1C conversion to inches 1A answer 1SF substitution 1CA answer　　　　　　　(4)	**M** **L2**
			[32]
QUESTION 2　[28]			
2.1.1 (a)	Monthly repayment = $\dfrac{950\,000}{1\,000} \times 10,29$✓ 　　　　　 = R9 775,50✓	1SF substitution 1CA answer　　　　　　　(2)	**F** **L2**
(b)	Total cost = R9 775,50 × 360✓ 　　　　 = R3 519 180✓	1MA multiplying by 360 1CA answer　　　　　　　(2)	**F** **L2**
(c)	Interest = R3 519 180 – R950 000✓ 　　　 = R2 569 180✓	1M subtracting correct values 1CA answer	**F** **L3**

	% interest $= \dfrac{2\,569\,180}{3\,519\,180}$ ✓$\times 100\%$ $= 73{,}0\%$✓	1M dividing correct values 1CA answer (4)	
2.1.2	Price in 2017 $= \dfrac{\text{R950 000}}{1{,}062}$ ✓ $= \text{R894 538,61}$✓ **OR** Price in 2017 $= \dfrac{\text{R950 000}}{106{,}2\%}$✓ $= \text{R894 538,61}$✓ **OR** Inflation $= \dfrac{6{,}2}{106{,}2} \times \text{R950 000}$ $= \text{R55 461,39}$✓ Price in 2017 $= \text{R950 000} - \text{R55 461,39}$ $= \text{R894 538,61}$✓	1MA dividing by 1,062 1A answer OR 1MA dividing by 106,2% 1A answer OR 1MA of multiplying 1A answer (2)	**F** **L2**
2.2.1	It is the side on which the sun shines most during the day✓✓ **OR** The sun spends most of the time on the North side of the house✓✓ **OR** The rooms are getting the most sunlight✓✓	2O reason (2)	**MP** **L4**
2.2.2	Area of Bedroom 1 = length × breadth $= 4{,}2672 \text{ m} \times 3{,}6576 \text{ m}$✓ $= 15{,}61 \text{ m}^2$ ✓ Area of Living room $= 4{,}5720 \text{ m} \times 4{,}2672 \text{ m}$ $= 19{,}51 \text{ m}^2$✓ Area of the passage $= 12{,}5\% (15{,}61 + 19{,}5) \text{ m}^2$✓ $= 4{,}39 \text{ m}^2$ ✓ Total area $= (15{,}61 + 19{,}51 + 4{,}39) \text{ m}^2$✓ $= 39{,}51 \text{ m}^2$ $\approx 40 \text{ m}^2$ ✓	1SF substitution 1CA area of bedroom 1 1CA area of the living room 1M finding 12,5% 1CA area of passage 1M adding areas 1CA total area rounded off. (7)	**M** **L3**
2.2.3 (a)	Labour cost: No of boxes $= \dfrac{40 \text{ m}^2}{2{,}48 \text{ m}^2}$ ✓ $= 16{,}13\ldots$ ≈ 17✓ Labour cost $= \text{R1 200} + \text{R120} \times 17$✓ $= \text{R3 240}$✓	CA from 2.2.2 1M dividing by 2,48 m² 1CA number of boxes 1M finding labour cost 1CA total labour cost (4)	**F** **L2**
(b)	Cost of boxes $= \text{R169,90} \times 17$ $= \text{R2 888,30}$✓ Underlayer cost $= \text{R54,90} \times 40$ $= \text{R2 196}$✓ Skirting $= \text{R679,60}$ Sealant $= \text{R129,80}$	1CA cost of boxes 1CA underlayer cost	**F** **L4**

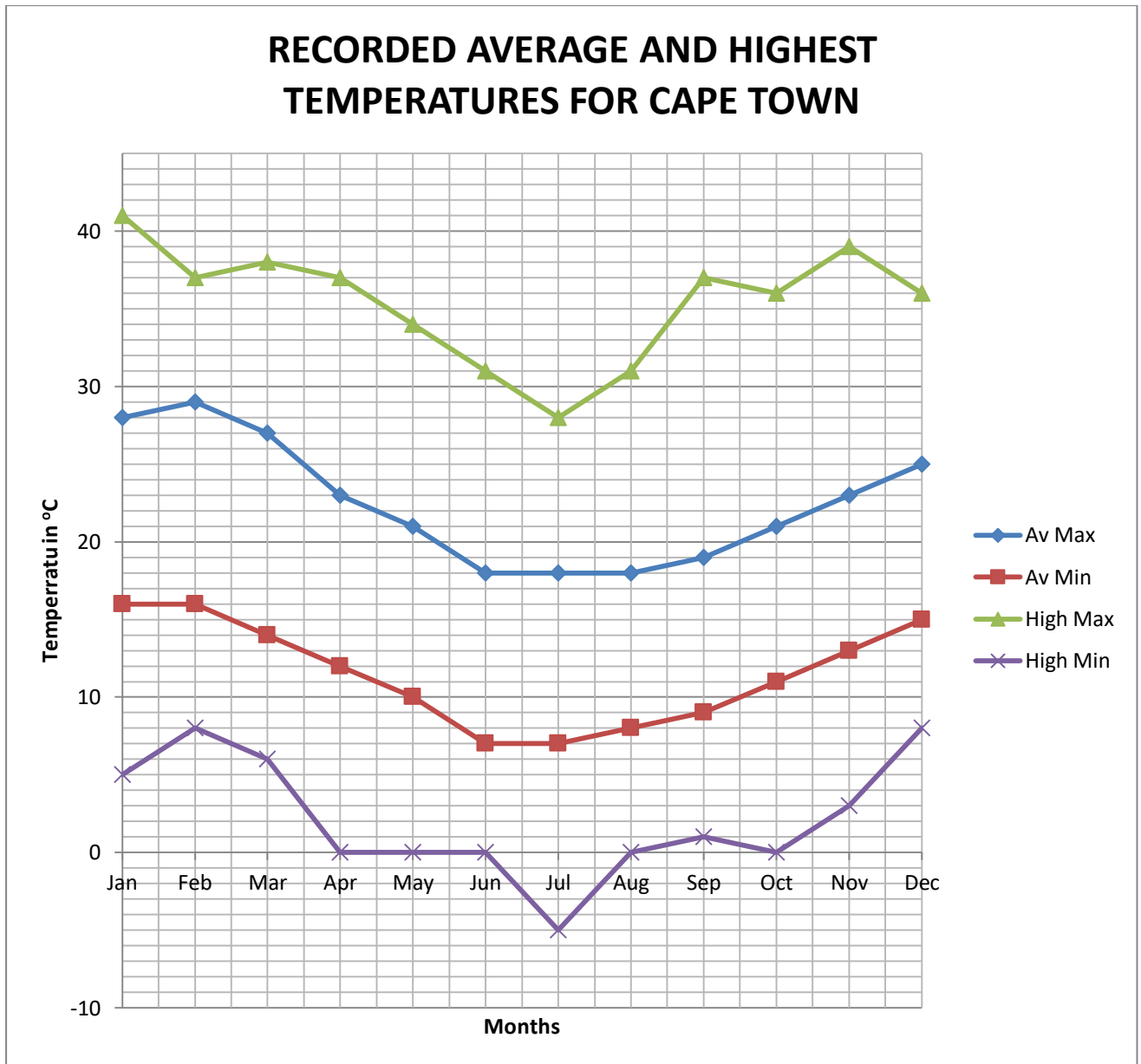|			
	Total cost of material = R2 888,30 + R2 196 + R679,60 + R129,80✓ = R5 893,70✓ Total expenditure = R5 893,70 + R3 240 = R9 133,70✓ The budget will be enough, there is a surplus of R866,30✓	1MCA adding cost of all materials 1CA total 1CA total expenditure 1J justification (6)	
			[29]

QUESTION 3 [16]

3.1	Percentage of blacks = 100 – (8,8 + 8,1 + 2,5)% = 80,6%✓ Black population in 2016 = 80,6% × 55 653 654✓ = 44 856 845,12✓ ≈44 856 845 or 44 856 846✓	1A correct percentage 1M using % 1CA black population 1R rounding up or down (4)	**D** **L3**
3.2	Number of whites = 8,9% × 51 770 560✓ = 4 607 579,84✓ Number of white females = 51,64% × 4 607 579,84✓ = 2 379 354,229 ≈ 2 379 354✓ Tumi's calculation is not correct.✓	1MA using % 1CA white population 1MA using % of white females 1CA simplification 1J verification (5)	**D** **L4**
3.3	P(of coloured population) = 100% - (79,6 + 8,9 + 2,5)%✓ = 100% - 81%✓ = 9 % ✓	1MA adding 1M subtraction 1A answer (3)	**P** **L3**
3.4	Indian population in 2011 = 2,5% × 51 770 560✓ = 1 294 264✓ Indian population in 2016 = 2,5% × 55 653 654 = 1 391 341✓ Tumi's comment is not correct, the population increased.✓	1M multiplication 1A value in 2011 1A value in 2016 1O opinion (4)	**D** **L4**
			[16]

QUESTION 4 [20]

4.1.1	Difference = 28 ℃ −(−5 ℃)✓✓ = 33 ℃✓	1RT reading values from table 1M subtracting 1CA difference (3) **AO**	**M** **L2**
4.1.2	Range = maximum value – minimum value✓ = 36 – 8✓ = 28✓ ∴ December is the month with the lowest range ✓	1A Identifying correct values 1M concept of range 1CA range 1A correct month (4)	**D** **L2**

4.1.3	See ANSWER SHEET below	$1A \times 6$ for each two points plotted correctly 1CA joining the points (7)	**D** **L2**
4.1.4	$111,2 \,°\text{F} = °\text{C} \times \dfrac{9}{5} + 32$✔ $°\text{C} \times \dfrac{9}{5} = 111,2 - 32$✔ $°\text{C} = 79,2 \div \dfrac{9}{5}$✔ $= 44°\text{C}$✔	1SF substitution 1S simplification 1S simplification 1CA Celsius value (4)	M L2
4.2	Width of screen on diagram = 25 mm✔ Length of screen on diagram = mm✔ Scale is 2:5. This means that the actual width is $\dfrac{5}{2}$ (2,5) times the given width. ✔ Actual width of screen $= \dfrac{5}{2} \times 25 = 62,5$ mm✔ Actual length of screen $= \dfrac{5}{2} \times 43 = 107,5$ mm✔ **OR** Scale drawing : width of screen $2 : 5 = 25 : x$ ✔ $\dfrac{2}{5} = \dfrac{25}{x}$ ✔ $2x = 125$ $x = 62,5$ mm ✔ Scale drawing : length of screen $2 : 5 = 43$✔$: y$ $y = \dfrac{43 \times 5}{2}$ $y = 107,5$ mm✔ **Accept [24 – 26] width** **[41 – 43] length**	1A width on diagram 1A length on diagram 1M using given scale 1CA actual width 1CA actual length **OR** 1M using the given scale 1A width on diagram 1CA actual width 1A length on diagram 1CA actual length (5)	MP L2
			[23]

TOTAL : 100

ANSWER SHEET

RECORDED AVERAGE AND HIGHEST TEMPERATURES FOR CAPE TOWN

1A × 6 for each two points plotted correctly

1CA joining the points (7)