education

Department:
Education
REPUBLIC OF SOUTH AFRICA

NATIONAL
SENIOR CERTIFICATE

GRADE 12

MATHEMATICAL LITERACY P2

MEMORANDUM

NOVEMBER 2008

MARKS: 150

SYMBOL	EXPLANATION
A	Accuracy
CA	Consistent accuracy
C	Conversion
J	Justification (Reason/Opinion)
M	Method
MA	Method with accuracy
P	Penalty, e.g. for no units, incorrect rounding off etc.
R	Rounding off
RT/RG	Reading from a table/Reading from a graph
S	Simplification
SF	Substitution in a formula

This memorandum consists of 22 pages.

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QUESTION 1 [23]			
Ques	**Solution**	**Explanation**	**AS**
1.1	$\overset{\checkmark M}{}$ $\mathbf{A} = 3 \times 3 \qquad \checkmark CA$ $\quad = 9$ $\overset{\checkmark M}{}$ $\mathbf{B} = 180 \div 3 = 60 \; \checkmark CA$	1M Multiplication 1CA Solution 1M Division 1CA Solution (4) **Divide by 3 in A – max 1** **Multiplying by 3 in B – max 1** **ANSWER ONLY FULL MARKS**	12.2.1
1.2	The number of girls = $3 \times 2\,550$ $\checkmark MA$ $\qquad\qquad = 7\,650$ $\checkmark CA$ The total number of learners = $7\,650 + 2\,550$ $\qquad\qquad\qquad = 10\,200$ $\checkmark CA$ **OR** Total number of learners = $4 \times 2\,550$ $\checkmark M \; \checkmark A$ $\qquad\qquad = 10\,200$ $\checkmark CA$	1MA Multiplication 1CA Solution 1CA Solution 1M Multiplication 1A Four times 1CA Solution (3) **ANSWER ONLY: FULL MARKS**	12.2.1
1.3.1	Dina's median mark = $\left(\dfrac{58+62}{2}\right)\%$ $\checkmark M$ $\qquad\qquad = 60\,\%$ $\checkmark CA$	1M Concept of median 1CA Median mark (2) **NO PENALTY FOR OMITTING %** **MAXIMUM 1 IF SUBTRACT** **ORDER OF OPERATIONS INCORRECT –** **1 MARK (89; 91)** **ANSWER ONLY: FULL MARKS**	12.4.3
1.3.2	Mpho's mean mark $= \dfrac{36+42+48+58+60+61+62+76+86}{9}\%$ $\checkmark M$ $= \dfrac{529}{9}\%$ $\checkmark CA$ $\approx 58{,}78\,\%$ $\checkmark CA$	1M Concept of mean 1CA Correct addition 1CA Mean (3) **If Dina's mean calculated – max 2** **Data recorded incorrectly – max 2** **provided no. of scores same as** **denominator** **ANSWER ONLY: FULL MARKS**	12.4.3
1.3.3	Dina's range = $(86 - 48)\%$ $\checkmark M/A$ $\qquad\qquad = 38\,\%$ $\checkmark CA$	1M/A Subtracting largest and lowest values 1CA Range (2) **ANSWER ONLY: FULL MARKS**	12.4.3

NSC –Final Marking Guideline

Ques	Solution	Explanation	AS
1.3.4	<table><tr><td></td><td>**Dina**</td><td>**Mpho**</td></tr><tr><td>**Median**</td><td>60%</td><td>60%</td></tr><tr><td>**Mean**</td><td>62,5%</td><td>58,78%</td></tr><tr><td>**Range**</td><td>38%</td><td>50%</td></tr></table> While they both have the same median, Dina's mean mark is greater (62,5%) than Mpho's (58,78%). ✓**J**✓**J** Also Dina's range is smaller than Mpho's, ✓**J** ✓**J** which means that Dina was more consistent with her marks.	2J for each reason 2J for each reason (4) MAY BE MARKED AS CA, BASED ON PREVIOUS ANSWERS A well worded JUSTIFICATION and no mathematical reasoning MAX 2 mark	12.4.4
1.4	Total number of words on two pages $= 270 \times 2 = 540$ ✓**A** 3 minutes $= 3 \times 60$ seconds $= 180$ seconds ✓**A** Dina's rate $= \dfrac{540 \text{ words}}{180 \text{ seconds}}$ ✓**M** $= 3$ words per second ✓**CA** Mpho's reading rate $= 2$ words per second ∴ Dina reads faster than Mpho. ✓**CA** **OR** Mpho's rate is 0,5 seconds per word ✓**A** Dina's rate $= \dfrac{3 \times 60 \text{ seconds}}{2 \times 270 \text{ words}}$ ✓**M** ✓**A** $= \dfrac{180 \text{ seconds}}{540 \text{ words}}$ $= 0,33$ seconds per word ✓**CA** ∴ Dina reads faster than Mpho. ✓**CA** **OR** In 3 minutes Mpho will read $= 180 \times 2$ words ✓**M**✓**C** $= 360$ words ✓**CA** ✓**CA** Dina reads 540 words in 3 minutes ∴ Dina reads faster than Mpho. ✓**CA** **OR**	1A Number of words on two pages 1A Number of seconds in three minutes 1M Dividing 1CA Dina's rate 1CA Conclusion 1M Converting from seconds to minutes 1A Words per minute 1CA Multiplying 1CA Solution 1CA Conclusion 1C Converting minutes to sec 1M multiplication 1CA number of words 1CA number of words 1CA Conclusion	12.1.1

Ques	Solution	Explanation	AS
	OR Total number of words on two pages $= 270 \times 2 = 540$ ✓**A** Mpho's time $= \dfrac{540 \text{ words}}{2 \text{ words per second}}$ $= 270$ seconds✓**CA** $= \dfrac{270 \text{ seconds}}{60 \text{ seconds per minute}}$ ✓**M** $= 4\dfrac{1}{2}$ minutes✓**CA** $\therefore$ Dina reads faster than Mpho. ✓**CA** **OR** Dina's rate $= \dfrac{2 \times 270 \text{ words}}{3 \text{ minutes}}$ ✓**A**✓**M** $= 180$ words per minute ✓**CA** Mpho's rate $= 2 \times 60$ $= 120$ words per minutes✓**CA** $\therefore$ Dina reads faster than Mpho. ✓**CA** **OR** Total number of words on two pages $= 270 \times 2 = 540$ ✓**A** Mpho's time $= \dfrac{540 \text{ words}}{2 \text{ words per second}}$ ✓**M** $= 270$ seconds✓**CA** Dina's time $= 3$ minutes $= 180$ seconds✓**C** $\therefore$ Dina reads faster than Mpho. ✓**CA**	1A Calculating number of words on 2 pages 1CA Calculating time 1M Converting time to minutes 1CA Mpho's time 1CA Conclusion 1A Calculating number of words on 2 pages 1M dividing 1CA Calculating rate 1CA Calculating rate 1CA Conclusion 1A Calculating number of words on 2 pages 1M dividing 1CA Calculating time 1C Converting time to minutes 1CA Conclusion (5) **Penalty of 1 if used 270 only** **Dina reads faster with no work – max 1** **Final mark to be consistent with calculations**	

QUESTION 2 [28]	PENALTY for ROUNDING OFF in QUESTION 2.4.2		
Ques.	**Solution**	**Explanation**	**AS**
2.1	Volume of the basin = $\pi r^2 h$ $\qquad\qquad = 3{,}14 \times (30 \text{ cm})^2 \times 40 \text{ cm}$ ✓**SF** $\qquad\qquad = 113\,040 \text{ cm}^3$ ✓**CA**	1SF Substitution 1CA Correct volume (2) $\boxed{\begin{array}{l}\pi \ (113\,097{,}34) \\[4pt] \dfrac{22}{7}\,(113\,142{,}86)\end{array}}$ ☐ ANSWER ONLY: FULL MARKS	12.3.1
2.2	Half of the volume of the basin = $\dfrac{113040 \text{ cm}^3}{2}$ ✓**M** $\qquad\qquad\qquad = 56\,520 \text{ cm}^3$ ✓**CA** $\qquad\qquad\qquad = 56{,}52 \text{ litres}$ ✓**CA** Each time she washes and rinses the dishes she uses: $56{,}52 \ \ell \times 2$ half-filled basins $= 113{,}04$ litres ✓**CA** Thus water used to wash three times a day: ✓**CA** $113{,}04$ litres $\times 3$ washings per day $= 339{,}12$ litres **OR** Two half-filled basins = 1 full basin ✓**M**✓**CA** $\quad\therefore$ Volume $= 113{,}04$ litres ✓**CA** Thus, Volume/day $= 3 \times 113{,}04$ litres ✓**CA** $\qquad\qquad\qquad = 339{,}12$ litres ✓**CA**	1M Dividing by 2 1CA Volume 1CA Conversion 1CA Calculating litres for a single wash 1CA Number of litres for 3 washes 1M Concept of two halves or implied 2CA Volume 1CA Multiplying 1CA Volume/day (5) ☐ ANSWER ONLY: FULL MARKS	12.3.1 12.3.2
2.3.1	According to the advertisement, the dishwasher would use $= \dfrac{339{,}12}{9} \ \ell$ ✓**M** $\qquad = 37{,}68 \ \ell$ ✓**CA** OR Half of the volume $= 56{,}52 \ \ell$ $\dfrac{1}{9}$ th of half of the volume $= \dfrac{56{,}52\ell}{9} = 6{,}28 \ \ell$ ✓**M** 2 halves of the basins $= 2 \times 6{,}28 \ \ell = 12{,}56 \ \ell$ 3 times a day $= 3 \times 12{,}56 \ \ell$ $\qquad\qquad = 37{,}68 \ \ell$ ✓**CA**	1M Division 1CA Simplification 1M Division 1CA Simplification (2) ☐ **If divide by 10, max 1** ☐ **If 9 times is read as 9%** **308,6 ℓ max 1 mark** ☐ ANSWER ONLY FULL MARKS	12.3.1

Ques.	Solution	Explanation	AS
2.3.2	✓**CA** Thandi would save 301,44 ℓ per day, which seems to be an exaggeration and thus is not realistic. Thandi would be saving water. ✓**J** ✓**J**	1CA Own opinion 2J Reason(s) (3) **YES OR NO – MAX 1 BASED ON CALCULATIONS**	12.3.1

2.4.1 a	Balance still owing
	= R 2 699,00 – 10% of R 2 699,00 ✓**M**
	= R 2 699,00 – 0,01 × R 2 699,00
	= R 2 699,00 – R 269,90 ✓**CA**
	= R 2 429,10 ✓**CA**
	
	OR
	       ✓**M**
	Balance still owing = 90% of R 2 699,00
	       = 0,90 × R 2 699,00✓**CA**
	       = R2 429,10✓**CA**
	
	OR
	Balance still owing = 24 ×R 177,53 ✓**M** ✓**A**
	       = R 4 260,72 ✓**CA**
		1M Finding balance owing
		
		1CA Computation
		
		1CA Amount owing
		
		1M 90%
		1 CA Computation
		1 CA Balance owing
		
		1M Multiplication
		1 A Instalment
		1 CA Balance owing (3)
		ANSWER ONLY: FULL MARKS
			12.1.3

2.4.1 b	Total cost = R 269,90 + (24 × R 177,53) ✓**M** ✓**CA**
	
	    = R 269,90 + R 4 260,72 ✓**CA**
	
	    = R 4 530,62 ✓**CA**
		1M Finding total amount
		1CA Using correct values from advertisement
		1CA Total paid over 24 months in instalments
		1CA Total (4)
		
		ANSWER ONLY: FULL MARKS
			12.1.3

Ques.	Solution	Explanation	AS
2.4.2	$i = \dfrac{18}{100} \div 12$ ✓**M** $\qquad$ $i = 18\% \div 12$ ✓**M** $= \dfrac{18}{1200}$ $\qquad$ **OR** $\qquad$ $= \dfrac{0,18}{12}$ $= 0,015$ per month ✓**CA** $\qquad$ $= 0,015$ per month $\qquad\qquad\qquad\qquad\qquad\qquad$ ✓**CA** $n = 2 \times 12 = 24$ months $A = P(1 + i)^n$ $\qquad$ ✓**A** $\qquad\qquad$ ✓**A** ✓**SF** $\quad = R\,2\,699,00(1 + 0,015)^{24}$ $\quad \approx R\,3\,858,23$ ✓**CA** **OR** Amount paid back $= A$ $\qquad\qquad\quad = P(1 + i)^n$ $\qquad\qquad\qquad\qquad$ ✓**M** ✓**CA** $\qquad\qquad\quad$ ✓**A** $\qquad\qquad\quad = R2\,699,00\left(1 + \dfrac{18}{12 \times 100}\right)^{24}$ ✓**SF** $\qquad\qquad\quad = R\,2\,699,00(1 + 0,015)^{24}$ ✓**CA** $\qquad\qquad\quad \approx R\,3\,858,23$ ✓**CA**	1M Dividing by 12 1CA Value of i 1A Value of P 1A Value of n 1SF Substitution into formula 1CA Solution 1SF Substitution into formula 1CA Value of n 1M Dividing by 12 1CA Simplification 1A Value of P 1CA Solution $\qquad$ (6) **If i not converted with 2 years– max 5** **If i not converted but use 24 months – max 4** **If i converted with 2 years – max 4** **ANSWER ONLY FULL MARKS**	12.1.3
2.4.3	Total cost using the instalment option $= R\,4\,530,62$ $\qquad\qquad\qquad\qquad\qquad\qquad\qquad$ ✓**CA** Amount paid back using the loan option $= R\,3\,858,23$ $\qquad\qquad\qquad\qquad\qquad\qquad\qquad$ ✓**CA** With the loan option, Thandi pays R 672,39 less than what she would pay had she taken the instalment option Thandi should choose the loan option. ✓**J** **OR** Cash✓**A** because there is no interest to be paid✓**J**✓**J**	1CA Comparing the options 1CA Difference between the options 1J Thandi's choice 1A Cash 2J Learner's justification $\qquad\qquad\qquad\qquad$ (3) **Consider cultural inclinations regarding buying on credit** **Max 1 mark if no justification**	12.1.2
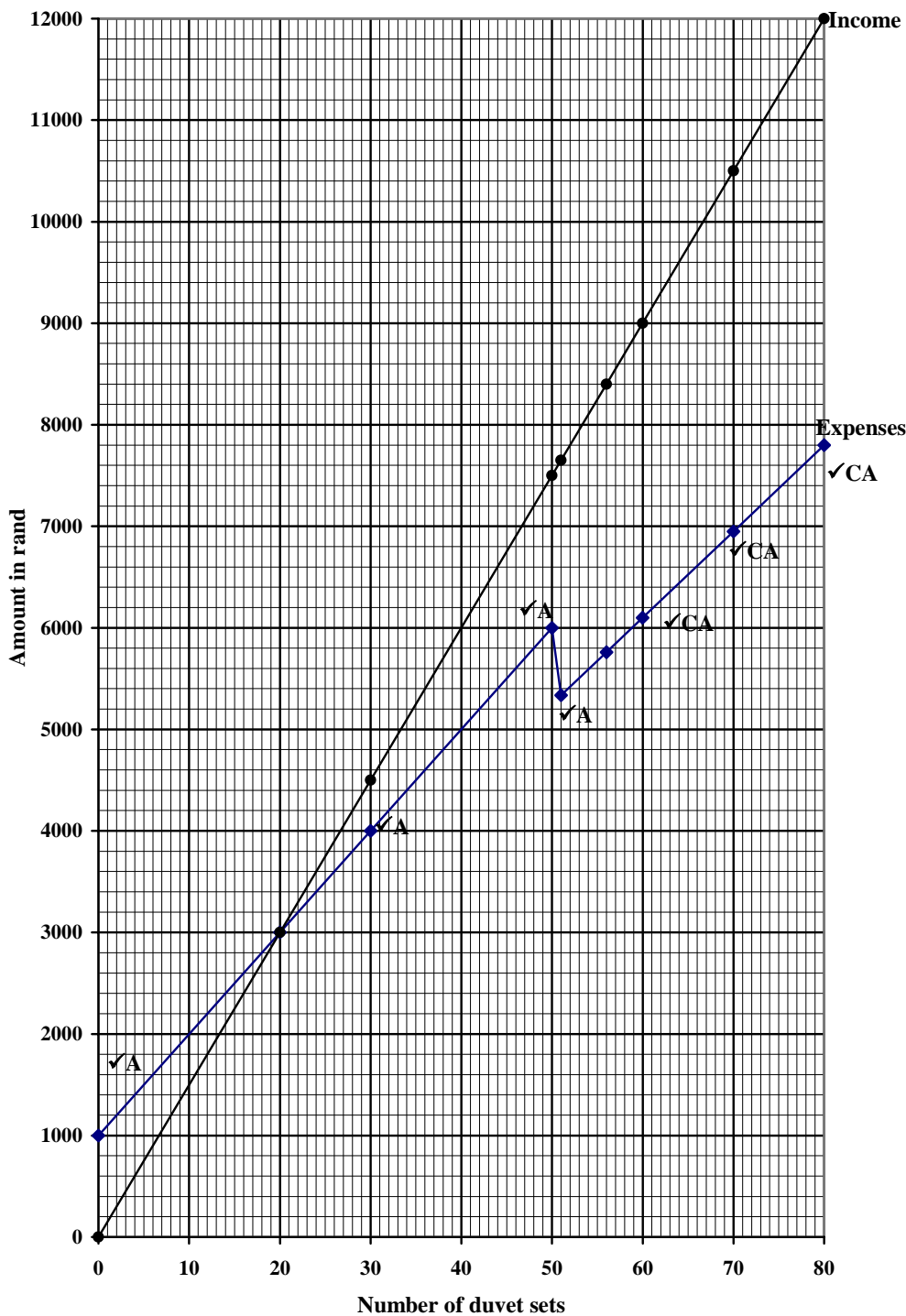
QUESTION 3 [29]			
Ques.	**Solution**	**Explanation**	**AS**
3.1.1	$$\text{Fixed monthly cost} = \frac{\checkmark\mathbf{M}}{\frac{\text{R}\,8400}{12}} + 4 \times \text{R}\,75 \ \checkmark\mathbf{A}$$ $$= \text{R}700 + \text{R}300$$ $$= \text{R}\,1\,000$$	1M for dividing annual fee and multiplying weekly fee 1A Multiplying by 4 (2)	12.1.3
3.1.2	Annual transport costs = R75 $\times$ 52 $\checkmark\mathbf{M}$ $\qquad\qquad\qquad = $ R3 900,00$\checkmark\mathbf{A}$ Total annual costs $\quad = $ R8 400,00 + R3 900,00 $\qquad\qquad\qquad = $ R12 300$\checkmark\mathbf{CA}$ Average monthly costs $= \dfrac{\text{R12 300}}{12}$ $\qquad\qquad\qquad = $ R1 025,00$\checkmark\mathbf{CA}$ The fixed costs for February is R25,00 less than the average monthly fixed. $\checkmark\mathbf{J}$ **OR** Annual transport costs = R75 $\times$ 52 $\checkmark\mathbf{M}$ $\qquad\qquad\qquad = $ R3 900,00$\checkmark\mathbf{A}$ Average annual transport cost $= \dfrac{\text{R3 900}}{12}\checkmark\mathbf{CA}$ $\qquad\qquad\qquad = $ R325$\checkmark\mathbf{CA}$ February's monthly transport cost = R300 The monthly travel costs for February is R25,00 less than the average monthly travel costs. $\checkmark\mathbf{J}$	1M multiplying by 52 1A Calculating the annual transport cost 1CA Calculating total annual fixed costs 1CA Average cost 1J Own opinion **If multiply by 48, max 4 marks** 1M multiplying by 52 1A Calculating the annual transport cost 2CA Average cost 1J Own opinion (5)	

Ques.	Solution	Explanation	AS
3.2	15% reduction means the cost = 85% of R100 ✓**M** New production cost = 0,85 × R100 = R85,00 ✓**CA** **OR** 15% reduction = $\dfrac{15}{100}$ × R100 = R15 ✓**M** New production cost = R100 – R15 = R85 ✓**CA**	1M Concept of reduction 1CA Solution 1M Concept of reduction 1CA Solution (2) ANSWER ONLY FULL MARKS	12.1.1

3.3	80 is more than 50, so the cost is R85 per duvet set.
	
	Total cost = fixed cost + (no. of duvet sets × cost per set)
	So C = R1 000 + 70 × R85 ✓**M**
	      = R1 000 + R5 950
	      = R 6 950 ✓**CA**
	
	R 1 000 + D × R 85 = R 7 800✓**M**
	      D × R 85 = R 6 800
	
	      D = $\dfrac{R\,6\,800}{R\,85}$ ✓**S**
	
	      D = 80 ✓**CA**
	OR
	
	Production costs for D = R7 800 – R1 000✓**A**
	                = R6 800
	
	∴ D = $\dfrac{R6\,800}{R85}$✓**M**
	      = 80✓**CA**
	OR
	                ✓**M**
	R 1 000 + 80 × R 85 = R7 800 ✓**A**
	                D = 80 ✓**CA**
		1M Cost per set
		
		1 CA Total Cost
		
		1M Substitution
		
		1S Simplification
		
		1 CA Number of duvets
		
		1A Calculating production cost
		
		1M Dividing
		
		1CA Value for D
		
		1M Substitution
		1A Calculating production cost
		1CA Value for D (5)
		
		CHECK IF R100 IS USED FOR COST PER DUVET SET
		
		ANSWER ONLY: FULL MARKS
			12.2.1

Ques.	Solution	Explanation	AS
3.4			12.2.2

INCOME AND EXPENSES

2A Plotting given points from table   2CA Plotting calculated points (C; D)
1A Joining points up to (50 ; 6000) with straight lines
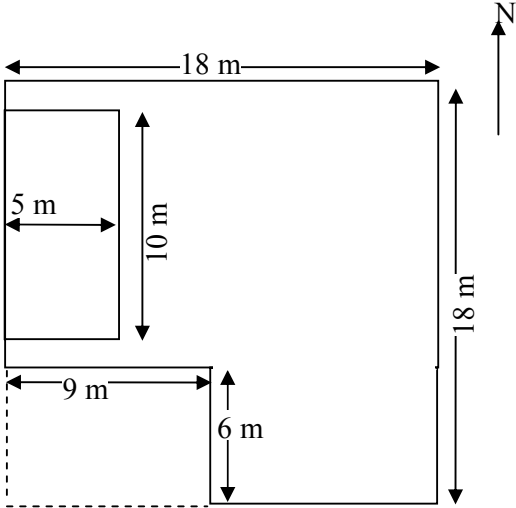1A Plotting (51 ; 5335)   1CA Joining points up to (80 ; 7800)

(7)

3.5.1	20 duvet sets ✓**RG**✓**RG**	2RG Reading from graph (2)	12.2.3
3.5.2	Profit = Income – Expenses ✓**RG** ✓**RG** = R12 000 – R7 800 = R4 200 ✓**CA**	1RG Reading Income from graph 1RG Cost 1CA Solution (3) ANSWER ONLY: FULL MARKS	12.2.3
3.5.3	Profit = Income from 70 sets – Expenses from 80 sets ✓**RG** ✓**CA** = R10 500 – R7 800 = R2 700 ✓**CA**	1RG Reading Income from graph 1CA Expenses 1CA Solution (3) If expense – income but answer positive, full marks ANSWER ONLY: FULL MARKS	12.2.3
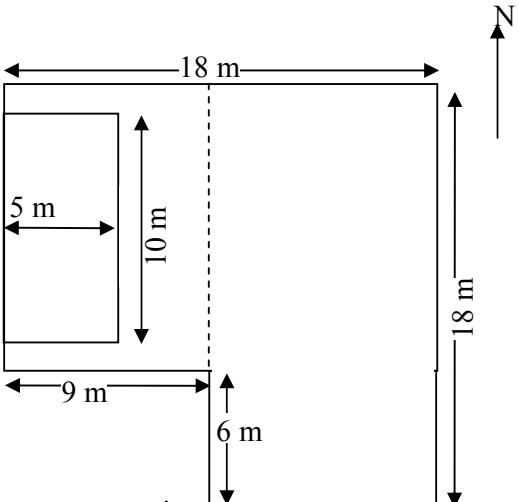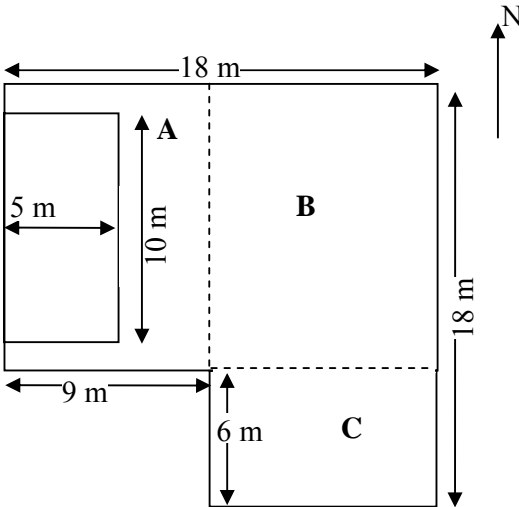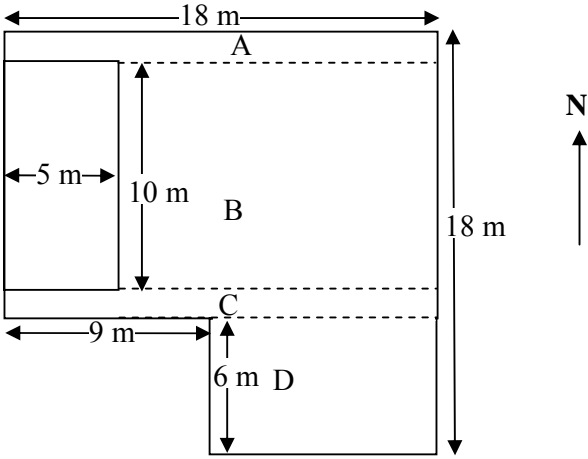
QUESTION 4   [22]

Ques	Solution	Explanation	AS
4.1.1	Difference between average annual income in Gauteng and Eastern Cape ✓**RG** ✓**RG** = 80 000 – 28 000✓**M** = R 52 000 ✓**CA** **OR** ✓**RG** ✓**RG** (R80 – R 28) thousands✓**M** = R52 thousand✓**CA**	2RG Reading values from the graph 1M Subtraction 1CA Difference 2RG Reading values from the graph 1M Subtraction 1CA Difference (4) **ANSWER ONLY FULL MARKS**	12.4.4
4.1.2	✓**J** The higher the average income, the lower the unemployment rate. ✓**J** **OR** ✓**J** The lower the average income, the higher the unemployment rate. ✓**J** **OR** ✓**J** There is a negative correlation between the average annual income and the unemployment rate. ✓**J** **OR** No relationship when provinces are taken into account. ✓**J**✓**J**	2J Opinion (2)	12.4.4
4.1.3	Gauteng has a higher average annual income and lower unemployment rate than the Eastern Cape. The chances then, are that, the person will earn a better salary in Gauteng and the prospects of being employed in Gauteng are better than in the Eastern Cape. ✓**J**✓**J** **OR** There are more job opportunities✓**J**✓**J** **OR** Any other valid reason✓**J**✓**J**	2J Opinion (2)	12.4.4

Ques	Solution	Explanation	AS
4.2.1	<table><tr><td colspan="4" style="text-align:center">**LEBO'S MONTHLY BUDGET**</td></tr><tr><td></td><td></td><td>R</td><td>c</td></tr><tr><td>Nett monthly salary</td><td></td><td>10 625</td><td>00</td></tr><tr><td>Money sent home: 35% of R10 625,00 ✓M</td><td>A</td><td>✓A 3 718</td><td>75</td></tr><tr><td>Amount for living expenses</td><td>B</td><td>✓CA 6 906</td><td>25</td></tr><tr><td colspan="4"></td></tr><tr><td>LIVING EXPENSES</td><td></td><td></td><td></td></tr><tr><td>Food and rent</td><td></td><td>3 500</td><td>00</td></tr><tr><td>Transport: 21 x R18,00 ✓M</td><td></td><td>✓A 378</td><td>00</td></tr><tr><td>Cellphone</td><td></td><td>✓A 135</td><td>00</td></tr><tr><td>Clothing account</td><td></td><td>250</td><td>00</td></tr><tr><td>Entertainment: 10% of R10 625,00 ✓M</td><td></td><td>✓A 1 062</td><td>50</td></tr><tr><td style="text-align:center">TOTAL LIVING EXPENSES</td><td>C</td><td>✓CA 5325</td><td>50</td></tr><tr><td colspan="4"></td></tr><tr><td style="text-align:right">Amount remaining</td><td>D</td><td>✓CA 1 580</td><td>75</td></tr></table>	1M Finding money sent home 1A Amount sent home 1CA Amount remaining 1M Calculating transport costs 1A Transport cost 1A Filling in given values 1M Finding money for entertainment 1A Entertainment cost 1CA Total costs 1CA Surplus (10) **ACCEPT R5 325,50 FOR VALUE OF B**	12.1.3 12.2.3
4.2.2	His proposed additional expenses = R1 259,00 + R500,00 ✓M = R 1 759,00 ✓CA The surplus amount of R 1 580,75 is less than the proposed additional expenses. He does not have enough money. ✓J ✓J **OR** ✓M ✓CA R 1 580,75 − R 1 259,00 − R500,00 = − R178,25 He does not have enough money. ✓J ✓J	1M Addition 1CA Additional expenses 2J Opinion 1M Subtraction 1CA Additional expenses 2J Opinion (4)	12.1.2

QUESTION 5 [21]   PENALTY OF ONE IF UNIT IS OMMITTED in QUESTION 5.2

Ques.	Solution	Explanation	AS
5.1	18m is represented by 60 mm 1mm on the scale map $= \dfrac{18 \times 1000\,\text{mm}}{60}$ ✓**M** $\qquad\qquad = 300$ mm The scale is 1: 300✓**A** **OR** The scale is = 60 mm : 18m✓**M** $\qquad\qquad$ = 1: 300✓**A**	 1M Converting 1A Solution 1M Writing down the ratio 1A Solution (2) ANSWER ONLY FULL MARKS	12.3.3
5.2	Length of wall behind the stage = 18 m – 6 m = 12 m $\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad$ ✓**M** Missing length of south wall = 18 m – 9 m = 9 m $\qquad\quad$✓**SF**$\qquad\qquad$✓**SF**$\qquad\qquad$✓**SF** Area $= (18\text{m} \times 12\text{m}) + (6\text{m} \times 9\text{m}) - (5\text{m} \times 10\text{ m})$ $\qquad$✓**CA**$\qquad\quad$✓**CA**$\qquad\quad$✓**CA** $\quad = 216\text{m}^2 + 54\text{m}^2 - 50\text{ m}^2$ $\quad = 220 \text{ m}^2$ ✓**CA** **OR** Area = Area of large square – area of bottom left rectangle – $\quad$ area of stage ✓**M** $\qquad\quad$✓**SF**$\qquad\qquad$✓**SF**$\qquad\qquad$✓**SF** $= (18 \text{ m} \times 18 \text{ m}) - (9 \text{ m} \times 6 \text{ m}) - (5 \text{ m} \times 10 \text{ m})$ $\quad$✓**CA**$\qquad$✓**CA**$\qquad$✓**CA** $= 324 \text{ m}^2 - 54 \text{ m}^2 - 50 \text{ m}^2$ $= 220 \text{ m}^2$ ✓**CA** **OR (see next page)**	 1M Calculating missing lengths 3SF Area formulae or implied 3CA Simplification 1CA Solution 1M Adding and subtracting areas 3SF Area formulae or implied 3CA Simplification 1CA Solution	12.3.1

Ques.	Solution	Explanation	AS
5.2 (contin)	 ✓SF Area of the stage = 5 m × 10 m = 50 m² ✓CA Area of left side of hall = 9 m × 12 m = 108 m² ✓SF ✓CA Area of right side of hall = 9 m × 18 m = 162 m² ✓SF ✓CA Area = Area of left side + area of right side – area of stage = 108 m² + 162 m² – 50 m² ✓CA = 220 m² ✓CA **OR** ✓CA Area of stage = 5 m × 10 m = 50 m² ✓SF Area of A = 9 m × 12 m = 108 m² ✓CA Area of B = 9 m × 12 m = 108 m² ✓SF ✓CA Area of C = 9 m × 6 m = 54 m² ✓CA Area = Area of A + Area of B + Area of C – Area of stage = (108 + 108 + 54 – 50) m² ✓CA ✓CA = 220 m² **OR**	3SF Area formulae or implied 3CA Simplification 1CA Simplification 1CA Solution 2SF Area formulae or implied 4CA Simplification 1CA Simplification 1CA Solution	

Ques.	Solution	Explanation	AS
5.2 cont..	 ✓**CA** ✓**SF** Area of A = 1 m × 18 m = 18 m^2 Area of B = 10 m × (18 – 5) m = 130 m^2 ✓**CA** Area of C = 1 m × 18 m = 18 m^2 ✓**CA** Area of D = 6 m × (18 – 9)m = 54 m^2 ✓**CA** ✓**SF** Total area = 18 m^2 + 130 m^2 + 18 m^2 + 54 m^2 ✓**M** = 220 m^2 ✓**A**	2SF Area formulae or implied 1CA Area A 1CA Area B 1CA Area C 1CA Area D 1M addition 1A solution (8)	

Ques.	Solution		Explanation	AS
5.3	Area of 1 tile $= \ell \times b$ $= 50 \text{ cm} \times 50 \text{ cm}$ $= 2\,500 \text{ cm}^2$ ✓S $= 0{,}25 \text{ m}^2$ ✓C	**OR** ✓C $= 0{,}5 \text{ m} \times 0{,}5 \text{ m}$ $= 0{,}25 \text{ m}^2$ ✓S	1S Substitution 1C Conversion	12.3.1
	The number of tiles needed $= \dfrac{\text{area to be tiled}}{\text{area of a tile}}$ ✓M $= \dfrac{220 \text{ m}^2}{0{,}25 \text{ m}^2}$ ✓CA $= 880 \text{ tiles}$ ✓CA 5% more means they need 105% ✓M Number of tiles needed $= 880 \times 105\%$ $= 924 \text{ tiles}$ ✓CA		1 M Division 1CA Substitution 1CA Simplification 1M Concept of increase 1CA Solution	12.3.1
	OR			
	Area of 1 tile $= \ell \times b$ $= 50 \text{ cm} \times 50 \text{ cm}$ ✓S $= 2\,500 \text{ cm}^2$ $= 0{,}25 \text{ m}^2$ ✓C	**OR** ✓C $= 0{,}5 \text{ m} \times 0{,}5 \text{ m}$ $= 0{,}25 \text{ m}^2$ ✓S	1S Substitution 1C Conversion	12.3.1
	5% more means they need 105% ✓M Area to be tiled $= 220 \text{ m}^2 \times 105\%$ ✓A $= 231 \text{ m}^2$ ✓CA Number of tiles needed $= \dfrac{231}{0{,}25}$ ✓M $= 924 \text{ tiles}$ ✓CA		1M increase in % 1A 105% 1CA area 1M division 1CA solution	

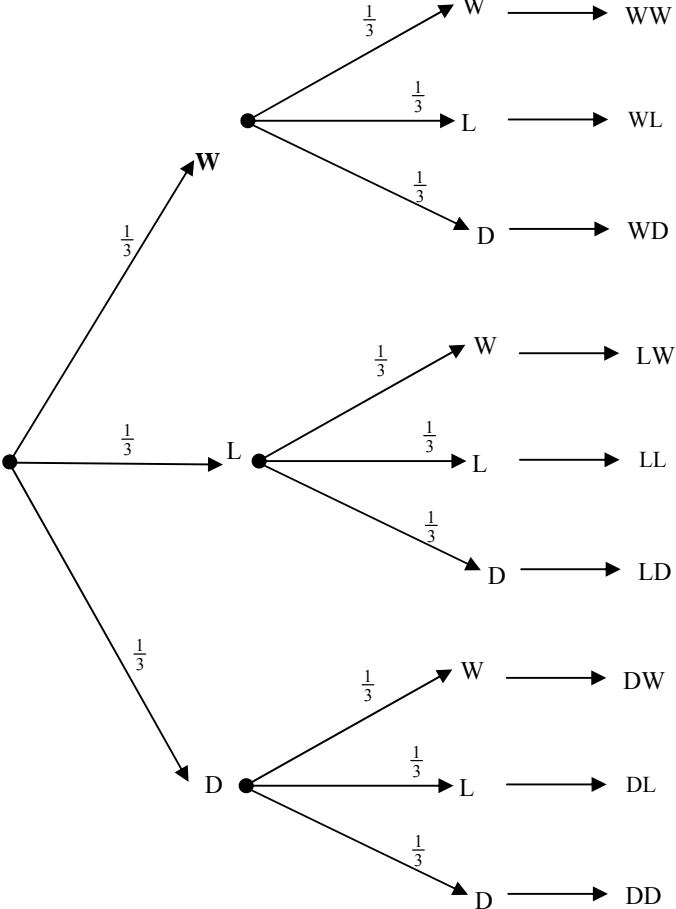| Ques.	Solution	Explanation	AS
	OR From alternative 5 of Question 5.2		
	1 Tile = 0,5 m × 0,5 m ✓**C**	1 C conversion	
	Area of A = 1 m × 18 m $= \dfrac{1}{0,5} \times \dfrac{18}{0,5} = 36 \times 2 = 72$ ✓**M**	4M Calculation of number of tiles	
	Area of B = 10 m × 13 m $= \dfrac{10}{0,5} \times \dfrac{13}{0,5} = 20 \times 26 = 520$✓**M**		
	Area of C = 1 m × 18 m $= \dfrac{1}{0,5} \times \dfrac{18}{0,5} = 36 \times 2 = 72$✓**M**		
	Area of D = 6 m × 9 m $= \dfrac{6}{0,5} \times \dfrac{9}{0,5} = 19 \times 12 = 216$✓**M**		
	Total number of tiles needed = 72 + 520 + 72 + 216 = 880 5% of 880 tiles = 44 tiles ✓**CA**	1CA Computation	
	So the number of tiles needed = 880 + 44 = 924✓**CA**	1CA Solution (7) ANSWER ONLY FULL MARKS	
5.4	✓**A** Number of black tiles needed $= \dfrac{4}{5} \times 924 = 739{,}2$✓**CA** Number of boxes of black tiles needed $= \dfrac{740}{12}$ ✓**M** = 61,67 ≈ 62 ✓**CA** **OR** The total number of boxes $= \dfrac{924}{12}$ ✓**CA** $= 77$ boxes✓**CA** ✓**A** The number of black boxes $= \dfrac{4}{5} \times 77$ $= 61{,}6$ ≈ 62 ✓**CA**	1A Ratio of black boxes 1CA Concept 1M Dividing 1CA Number of black boxes 1CA Method 1CA Total number of boxes 1A Ratio of black boxes 1CA Number of black boxes (4) ANSWER ONLY FULL MARKS	12.1.1 12.1.2 12.3.1

QUESTION 6   [27]

Ques.	Solution	Explanation	AS

6.1.1	5% more means that he gets 105%
	2006 salary = R 178 500 × 105% ✓**M**
	          = R 187 425 ✓**CA**
	
	OR
	
	2006 salary = R 178 500 + 5% of R 178 500 ✓**M**
	          = R 178 500 + R 8 925
	          = R 187 425 ✓**CA**
	
	OR
	
	2006 salary = $\dfrac{\text{salary in 2007}}{1,05} = \dfrac{\text{R 196 796,65}}{1,05}$ ✓**M**
	          = R 187 425 ✓**CA** ✓**CA**
		1M Concept of % increase
		1CA Solution
		
		1M Concept of increase
		
		1CA Solution
		
		1M Concept of decrease
		
		1CA Solution (2)
		
		ANSWER ONLY FULL MARKS
			12.1.3

6.1.2	2008 salary
	= R 196 796,25 × 105% **OR** $\dfrac{\text{R 216 967,87}}{1,05}$ ✓**M**
	= R 206 636,06 ✓**CA**
	
	Total salary over five years
	= 2005 salary + 2006 salary + 2007 salary
	  + 2008 salary + 2009 salary
	                      ✓**M**
	= R178 500 + R187 425 + R 196 796,25 + R206 636,06
	  + R216 967,87
	
	= R 986 325,18 ✓**CA**
		1M Concept of %
		increase/decrease
		
		1CA Solution
		
		1M Addition
		
		1CA Solution (4)
		ANSWER ONLY FULL MARKS
			12.1.1
			12.1.2
			12.1.3
			12.2.1

6.2.1	Bonus for goals scored = (5× R 450) ✓**M**
	              = R 2 250 ✓**A**
		1M Multiplication
		1A Solution
		                      (2)
		ANSWER ONLY FULL MARKS
			12.1.1
			12.2.1

6.2.2	Number of games won = 70% × 30 = 21 ✓**M**
	
	Bonus earned = 21 × R800 = R 16 800 ✓**CA**
	      OR
	
	Bonus for games won = R 800 × 70% of 30 ✓**M**
	              = R 16 800 ✓**CA**
	    OR
		1M Calculating games won
		
		1CA Bonus
		
		1M Calculating bonus
		1CA Bonus
		
		                      (2)
			12.1.1
			12.2.1

Ques	Solution	Explanation	AS
	OR Bonus for games won = 30 $\times$ 70% of R 800 ✓**M** 　　　　　　 = R 16 800 ✓**CA** 　　**OR** 70% of R 800 = R560,00 ✓**M** Bonus for games won = R560,00 $\times$ 30 　　　　　　 = R16 800 ✓**CA**	1M Calculating bonus 1CA Bonus 1M Calculating 70% 1CA Bonus　　　(2) ANSWER ONLY FULL MARKS	
6.2.3	✓**M** Total Gross income = R 196 796,25 + R 2 250 + R 16 800 = R 215 846,25 ✓**CA**	1M Adding all earnings 1CA Computation　(2) ANSWER ONLY FULL MARKS	12.1.3
6.3	£1 = R16,45 £36 960 = R16,45 $\times$ 36 960 ✓**M** 　　　　 = R607 992,00 ✓**A** Average annual salary = R607 992,00 $\div$ 2 　　　　　　　 = R303 996,00 ✓**CA** Difference in salary = R303 996,00 – R216 967,87 　　　　　　 = R87 028,13 ✓**CA** **OR** R216 967,87 = £13 189,54 ✓**A** Difference = £$\left(\dfrac{36\ 960}{2} - 13189,54 \right)$ ✓**M** 　　　 = £5 290,46 ✓**CA** 　　　 $\approx$ R87 028,07 ✓**CA**	1M converting 1A Salary in rands 1CA Average salary 1CA Difference 1A Salary in pounds 1M Difference in £ 1CA Salary in £ 1CA Conversion　(4) ANSWER ONLY FULL MARKS	12.1.3 12.3.2

Ques	Solution	Explanation	AS
6.4.1	**(See page 22 for an alternate solution)** MATCH 1 MATCH 2 **POSSIBLE OUTCOMES FOR THE TWO MATCHES** W → W → WW → L → WL → D → WD L → W → LW ✓CA → L → LL ✓A → D → LD D → W → DW → L → DL ✓CA ✓A → D → DD	2A Outcomes of match 2CA Outcomes for both matches (4)	12.4.5
6.4.2 a	Win both matches: number of events = 1 ✓M ✓CA So, P(win both matches) = $\dfrac{1}{9}$ **or** 0,11 or 0,1̇ **or** 11,11%	1M Possible event 1 CA Solution (2) **No working out 1 mark for numerator 1 mark for denominator**	12.4.5
6.4.2 b	Win only one of the matches: Number of events = 4 ✓M P(win only one of the matches) = $\dfrac{4}{9}$ **or** 0,44 **or** 0,4̇ **or** 44,44% ✓CA	1 M counting the possible outcomes 1CA Solution (2)	12.4.5

6.4.2 c	Draw at least one of the matches:
	Number of events = 5 ✓M ✓CA
	
	P(draw at least one of the matches)
	= $\dfrac{5}{9}$ **or** 0,56 **or** 0,5̇ or 55,56% ✓CA
	OR
	Not drawing: Number of events = 4 ✓M
	        P(not drawing) = $\dfrac{4}{9}$
	
	P(draw at least one of the matches) = $1 - \dfrac{4}{9}$ ✓CA
	
	         = $\dfrac{5}{9}$ **or** 0,56 **or** 0,5̇ or 55,56% ✓CA
		1M Concept of at least
		1CA number of events
		
		1CA Solution
		
		1M Concept of not
		
		1CA Subtraction
		
		1CA Solution (3)
			12.4.5

Ques	Solution	Explanation	AS
	The answer below is an alternative for QUESTION 6.4 only		12.4.5
6.4.2a	$P(\text{win}) = \frac{1}{3}$; $P(\text{lose}) = \frac{1}{3}$; $P(\text{draw}) = \frac{1}{3}$ ✓**M** $P(\text{win both matches}) = \frac{1}{3} \times \frac{1}{3} = \frac{1}{9}$ ✓**CA**	1M probability 1 CA Solution (2)	12.4.5
6.4.2b	$P(\text{win only one of the matches})$ $= P(WL) + P(WD) + P(LW) + P(DW)$ $= (\frac{1}{3} \times \frac{1}{3}) + (\frac{1}{3} \times \frac{1}{3}) + (\frac{1}{3} \times \frac{1}{3}) + (\frac{1}{3} \times \frac{1}{3})$ ✓**M** $= \frac{1}{9} + \frac{1}{9} + \frac{1}{9} + \frac{1}{9} = \frac{4}{9}$ ✓**CA**	1 M probability 1CA Solution (2)	12.4.5
6.4.2c	$P(\text{draw at least one of the matches})$ $= P(WD) + P(LD) + P(DW) + P(DL) + P(DD)$ ✓**M** $= (\frac{1}{3} \times \frac{1}{3}) + (\frac{1}{3} \times \frac{1}{3}) + (\frac{1}{3} \times \frac{1}{3}) + (\frac{1}{3} \times \frac{1}{3}) + (\frac{1}{3} \times \frac{1}{3})$ ✓**CA** $= \frac{1}{9} + \frac{1}{9} + \frac{1}{9} + \frac{1}{9} + \frac{1}{9} = \frac{5}{9}$ ✓**CA**	1M Concept of at least 1CA Simplification 1CA Solution (3)	12.4.5

TOTAL: **150**