



Province of the
EASTERN CAPE
EDUCATION

NATIONAL SENIOR CERTIFICATE

GRADE 12

SEPTEMBER 2013

MATHEMATICAL LITERACY P2 MEMORANDUM

MARKS: 150

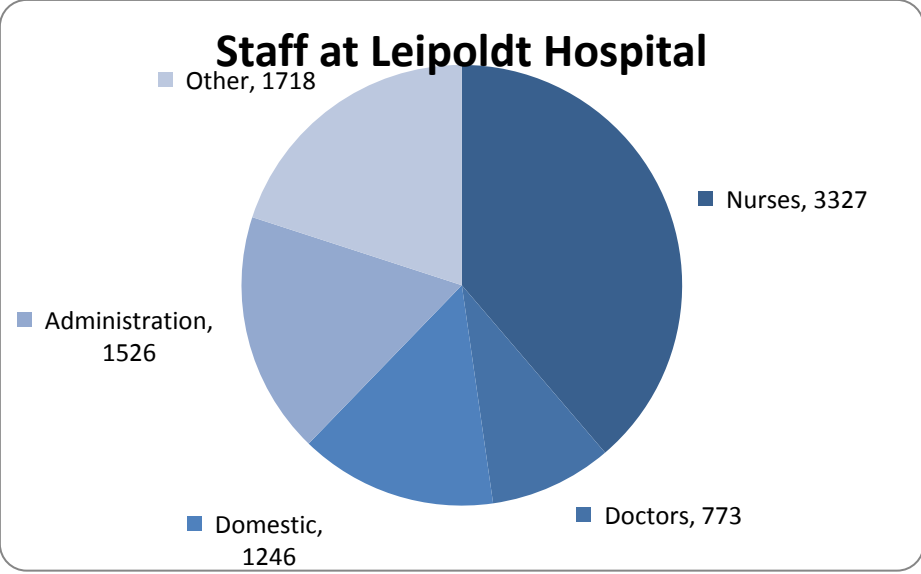
Symbol	Explanation
M	Method
MA	Method with accuracy
CA	Consistent accuracy
A	Accuracy/Answer
C	Conversion
S	Simplification
RT/RG/RM	Reading from a table/Reading from a graph/Read from map
F	Choosing the correct formula
SF	Substitution in a formula
J / O	Justification/Opinion
P	Penalty, e.g. for no units, incorrect rounding off etc.
R	Rounding Off/Reason

This memorandum consists of 10 pages.

QUESTION 1				
Question		Solution		
1.1	1.1.1	$\text{Deposit} = 392\,900 \times 0,15 \checkmark \checkmark$ $= R58\,935 \checkmark$	2:M 1:A	(3)
	1.1.2	$\% \text{ used} = \frac{58\,935}{400\,000} \times \frac{100}{1} \checkmark$ $= 14,73\% \checkmark$	1:M 1:A	(2)
	1.1.3	$P = 400\,000 - 58\,935$ $= R341\,065 \checkmark$ $i = 8,75 / 2$ $= 4,375 / 100$ $= 0,04375 \checkmark$ $n = 6 \times 2$ $= 12 \checkmark$ $A = P(1 + i)^n$ $= 341\,065(1 + 0,04375)^{12} \checkmark$ $= 341\,065(1,04375)^{12}$ $= 341\,065(1,67169815) \checkmark$ $= 570\,157,7296$ $= R570\,157,73 \checkmark$	1: M Finding P 1:M Finding i 1: M Finding n 1:SF 1:S 1:CA	(6)
	1.1.4	$P = 392\,900 - 58\,935$ $= R333\,965 \checkmark$ $i = 8,5\% + 1\%$ $= 9,5 / 100$ $= 0,095 \checkmark$ $A = P(1 + ni)$ $= 333\,965(1 + 6 \times 0,095) \checkmark$ $= 333\,965(1,57) \checkmark$ $= R524\,325,05 \checkmark$	1: M Finding P 1: M Finding i 1:SF 1:S 1:CA	(5)
	1.1.5	Interest paid = $524\,325,05 - 333\,965$ $= R190\,360,05 \checkmark$ $\% = \frac{190\,360,05}{524\,325,05} \times \frac{100}{1} \checkmark$ $= 36,3\% \checkmark$ Accept 36,31% Yes, interest paid is less than 40%. \checkmark	1: M Find interest amount 1:M 1:A 1:O	(4)
	1.1.6	Monthly payment = $\frac{524\,325,05}{72} \checkmark$ $= 7\,282,29 \checkmark$ Service and admin fee = $R7\,391,29 - 7\,282,29$ $= R109,00 \checkmark$	1:M 1:M 1:A	(3)

1.2	1.2.1	$P \checkmark = 15n \checkmark - 50 \checkmark$ OR Profit $\checkmark = 15 \times \text{no. of passengers} \checkmark - R 50 \checkmark$	A:3	(3)
	1.2.2	(A) $P = 15n - 50$ $= 15(2) - 50 \checkmark$ $= 30 - 50$ $= -R20 \text{ (loss)} \checkmark$	1:SF 1:A	
		(B) $P = 15n - 50$ $70 = 15n - 50 \checkmark$ $120 = 15n$ $8 = n \checkmark$	1:SF 1:A	(4)
	1.2.3	Less than 4 passengers $\checkmark \checkmark$ OR $n < 4 \checkmark \checkmark$ OR No profit will be made for less than 4 passengers. $\checkmark \checkmark$	2:A	(2)
	1.2.4	No. of trips $= 8 / 0,5 \checkmark$ OR No. of trips $= 8 \times 60$ $= 16 \checkmark$ $= 480 / 30$ $= 16$ Profit per day $= 14 \times 15 \times 16 - 50 \times 16 \checkmark$ $= 3\,360 - 800 \checkmark$ $= R2\,560 \checkmark$	1:M 1:A 1:M 1:S 1:A	(5)
				[37]
QUESTION 2				
2.1	2.1.1	C1 \checkmark and D1 \checkmark OR 1C \checkmark and 1D \checkmark	2:A	(2)
	2.1.2	South west \checkmark	1:A	(1)
	2.1.3	$2 \text{ cm} = 500 \text{ m}$ OR $2 \text{ cm} : 500 \text{ m} \checkmark$ $20 \text{ mm} \checkmark = 500\,000 \text{ mm} \checkmark$ $2 \text{ cm} = 50\,000 \text{ cm} \checkmark$ $1 : 25\,000 \checkmark$ $1 : 25\,000 \checkmark$	1:C 1:C 1:A	(3)
	2.1.4	Scale of map $= 1 : 25\,000$ Map distance $= 7,6 \text{ cm} \checkmark$ (Accept 7,4 cm – 7,8 cm) Distance in km $= \frac{7,6 \times 25\,000}{100\,000} \checkmark = \frac{190\,000}{100\,000}$ $= 1,9 \text{ km} \checkmark$ (Accept 1,85 – 1,95 km)	1:A length 1:M 1:A	(3)

	2.1.5	$\text{Time} = \frac{\text{Distance}}{\text{Speed}}$ $= \frac{1,9 \text{ km}}{1,5 \text{ km/h}} \checkmark$ $= 1,266... \text{ h} \times 60 \checkmark$ $= 76 \text{ min} \checkmark$ <p>(Accept 74 min – 78 min)</p>	2:M 1:C 1:A	(4)
2.2	2.2.1	$80\% \text{ of staff} = 3\,327 + 773 + 1\,246 + 1\,526 \checkmark$ $= 6\,872 \checkmark$ $\text{Total staff members} = \frac{6\,872}{80\%} \checkmark$ $= \frac{6\,872}{0,8} \checkmark$ $= 8\,590 \checkmark$ <p style="text-align: center;">OR</p> $20\% \text{ of staff}$ $= \frac{6\,872}{4} \checkmark$ $= 1\,718 \checkmark$ $\text{Total staff members} = 6\,872 + 1\,718$ $= 8\,590 \checkmark$	1:M 1:A 1:M 1:CA 1:CA	(5)
	2.2.2	<p>(P of not approaching an administration clerk)</p> $= \frac{\text{Total staff members} - \text{total administration clerks}}{\text{Total staff members}}$ $= \frac{8\,590 - 1\,526}{8\,590} \checkmark$ $= \frac{7\,064}{8\,590} \checkmark$ $= 0,822 \checkmark \quad \text{OR} \quad 82,2\% \checkmark$	1:M 1:M 1:CA	(3)
	2.2.3	$\text{Nurses} = \frac{3\,327}{8\,590} \times \frac{360}{1} \checkmark \quad \text{OR} \quad \frac{360}{8\,590} \times \frac{3\,327}{1} \checkmark$ $\approx 139,4^0$ $\text{Doctors} = \frac{773}{8\,590} \times \frac{360}{1} \checkmark \quad \text{OR} \quad \frac{360}{8\,590} \times \frac{773}{1} \checkmark$ $\approx 32,4^0$ $\text{Domestic} = \frac{1\,246}{8\,590} \times \frac{360}{1} \checkmark \quad \text{OR} \quad \frac{360}{8\,590} \times \frac{1\,246}{1} \checkmark$ $\approx 52,2^0$ $\text{Clerks} = \frac{1\,526}{8\,590} \times \frac{360}{1} \checkmark \quad \text{OR} \quad \frac{360}{8\,590} \times \frac{1\,526}{1} \checkmark$ $\approx 64^0$ $\text{Others} = \frac{1\,718}{8\,590} \times \frac{360}{1} \checkmark \quad \text{OR} \quad \frac{360}{8\,590} \times \frac{1\,718}{1} \checkmark$ $\approx 72^0$	5CA Dividing correct amounts and multiplying answer by 360	

		<p>Staff at Leipoldt Hospital</p>  <p>A pie chart titled 'Staff at Leipoldt Hospital' showing the distribution of staff across five categories. The categories and their counts are: Nurses (3327), Other (1718), Administration (1526), Domestic (1246), and Doctors (773). The chart is divided into five segments of varying shades of blue, with labels and counts placed around the chart.</p>	<p>1:M Label graph 5CA Accurate division of sections 1MA labelling each sector or providing a key</p>	(12)
				[33]
QUESTION 3				
3.1	3.1.1	<p>Statement is true ✓</p> <p>Entrant 3 meets the criteria for the height (1,55 m), ✓ but not for the mass (44 kg) ✓ and the BMI (underweight) ✓</p> <p>OR</p> <p>Entrant 5 meets the criteria for the BMI (normal), ✓ but not for the mass (52 kg) ✓ and the height (1,52 m) ✓</p> <p>OR</p> <p>Entrant 7 does not meet any of the criteria for the BMI (overweight), ✓ mass (45 kg) ✓ and the height (1,30 m) ✓</p> <p>OR</p> <p>Entrant 8 meets the criteria for the height (1,55 m) ✓ and the mass (61 kg), ✓ but not for the BMI (overweight) ✓</p> <p>OR</p> <p>Entrant 12 meets the criteria for the height (1,65 m) ✓ and the mass (72 kg), ✓ but not for the BMI (overweight) ✓</p> <p>OR</p> <p>Entrant 14 meets the criteria for the height (1,55 m) ✓ and the mass (71 kg), ✓ but not for the BMI (obese). ✓</p> <p>OR</p> <p>Entrant 15 meets the criteria for the mass (58 kg) ✓ and the BMI (normal), ✓ but not for the height (1,53 m). ✓</p> <p>OR</p> <p>Entrant 16 meets the criteria for the mass (55 kg) ✓ and the BMI (normal), ✓ but not for the height (1,51 m). ✓</p>	<p>1:A</p> <p>1:J (height) 1:J(mass) 1:J(BMI)</p>	(4)
	3.1.2	8 Entrants ✓✓	2:A	(2)

3.1.3	<p>Average (Mean) = $\frac{1,56+1,63+1,70+1,59+1,60+1,68+1,67+1,56}{8}$ ✓</p> <p>= $\frac{12,99}{8}$ ✓</p> <p>= 1,62375</p> <p>= 1,62 m ✓</p>	1:M 1:A 1:A	(3)
3.1.4	<p>Median = 55 ; 56 ; 57 ; 60 ; 60 ; 61; 62 ; 70 ✓</p> <p>= $\frac{60 + 60}{2}$ ✓</p> <p>= $\frac{120}{2}$</p> <p>= 60 kg ✓</p>	1:M 1:M 1:A	(3)
3.1.5	<p>BMI = $\frac{\text{Mass in kg}}{\text{Height in m}^2}$</p> <p>= $\frac{61}{1,55^2}$ ✓</p> <p>= $\frac{45}{2,4025}$ ✓</p> <p>= 25,39021852 ✓ Accept 25,39</p> <p>A person with a BMI of 25 – 29,9 is classified as overweight. ✓</p>	1:SF 1:S 1:A 1:O	(4)
3.1.6	<p>BMI = $\frac{\text{Mass in kg}}{\text{Height in m}^2} \times \frac{\text{Mass in pounds}}{\text{Height in inches}^2}$ ✓</p> <p>= $\frac{0,4536}{0,0254^2} \times \frac{\text{Mass in pounds}}{\text{Height in inches}^2}$ ✓✓</p> <p>= 703,0814062 $\times \frac{\text{Mass in pounds}}{\text{Height in inches}^2}$ ✓</p> <p>≈ 703 $\times \frac{\text{Mass in pounds}}{\text{Height in inches}^2}$ ✓</p>	1:M 1:SF 1:C to m 1:S 1:A	(5)
3.1.7	<ul style="list-style-type: none"> • Unhealthy lifestyle ✓ • Incorrect eating habits ✓ • No exercises ✓ <p>(Accept any relevant answer.)</p> <p>ONLY TWO</p>	2:A (1 mark each)	(2)
3.1.8	<ul style="list-style-type: none"> • Exercise ✓ • Follow a healthy diet ✓ <p>(Accept any relevant answer.)</p>	2:A (1 mark each)	(2)

3.2	<p><u>Soccer Gear</u></p> <p>T-shirts = $[263,15 + (263,15 \times 0,14)] \times 17 \checkmark$ OR $= 263,15 \times 17 \checkmark$ $= (263,15 + 36,84) \times 17$ $= 4\,473,55 \times 1,14 \checkmark$ $= 299,99 \times 17 \checkmark$ $= R5\,099,85 \checkmark$ $= R5\,099,83 \checkmark$</p> <p>Shorts = $149,99 \times 17$ $= R2\,549,83 \checkmark$</p> <p>Socks = $29,99 \times 17$ $= R509,83 \checkmark$</p> <p>Boots</p> <p>First 10 pairs = $[350 - (350 \times 0,1)] \times 10 \checkmark$ OR $= 350 \times 0,9 \times 10 \checkmark$ $= (350 - 35) \times 10$ $= R3\,150 \checkmark$ $= 315 \times 10$ $= R3\,150 \checkmark$</p> <p>Next 7 pairs = $[350 - (350 \times 0,15)] \times 7 \checkmark$ OR $= 350 \times 0,85 \times 7 \checkmark$ $= (350 - 52,50) \times 7$ $= R2\,082,50 \checkmark$ $= 297,50 \times 7$ $= R2\,082,50 \checkmark$</p> <p>Total = $R5\,099,83 + R2\,549,83 + R509,83 + R3\,150 + R2\,082,50$ $= R13\,391,99 \checkmark$</p> <p style="text-align: center;">OR</p> <p>Total = $R5\,099,85 + R2\,549,83 + R509,83 + R3\,150 + R2\,082,50$ $= R13\,392,01 \checkmark$</p> <p><u>Payment for community hall</u></p> <p>$\frac{2}{3} \times 450 = 300 \times 5 \checkmark$ $= R1\,500 \checkmark$</p> <p>Profit = 300×35 $= 10\,500 \checkmark$</p> <p>No, she will not have enough money for the soccer gear. There is still a shortfall of $R2\,891,99 = R13\,391,99 - R10\,500. \checkmark \checkmark$</p> <p style="text-align: center;">OR</p> <p>$R2\,892,01 = R13\,392,01 - 10\,500$</p>	<p>1:M</p> <p>1:S</p> <p>1:A</p> <p>1:MA</p> <p>1:MA</p> <p>1:M</p> <p>1:A</p> <p>1:M</p> <p>1:A</p> <p>1:MA</p> <p>1:M</p> <p>1:A</p> <p>1:MA</p> <p>2:O</p>	<p>(15)</p> <p>[40]</p>
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QUESTION 4																			
4.1	4.1.1	The area of 7 hectares OR 70 000 m ² to be cleaned. ✓	1:A	(1)															
	4.1.2	$A = \frac{70\,000}{50} \checkmark$ $= 1\,400 \checkmark$ $B = \frac{70\,000}{350} \checkmark$ $= 200 \checkmark$	1:M 1:A 1:M 1:A	(4)															
	4.1.3	$I = \frac{70\,000}{s}$ $= \frac{70\,000}{875} \checkmark$ $= 80 \checkmark$	1:M 1:A	(2)															
	4.1.4	70 000 ✓ = s ✓ x I ✓ OR 70 000 ✓ = sI ✓ ✓ OR $s \checkmark = \frac{70\,000}{I \checkmark} \checkmark$ OR $I \checkmark = \frac{70\,000}{s \checkmark} \checkmark$	3:A	(3)															
	4.1.5	The number of learners. ✓	1:A	(1)															
	4.1.6	<div><p>Number of square meters cleaned by each learner changes as the number of learner changes</p><table><thead><tr><th>Number of square meters cleaned</th><th>Number of learners</th></tr></thead><tbody><tr><td>100</td><td>700</td></tr><tr><td>350</td><td>200</td></tr><tr><td>700</td><td>100</td></tr><tr><td>1400</td><td>50</td></tr><tr><td>1750</td><td>40</td></tr><tr><td>3500</td><td>20</td></tr></tbody></table></div>	Number of square meters cleaned	Number of learners	100	700	350	200	700	100	1400	50	1750	40	3500	20	4: Any 4 points correctly plotted 1: Smooth curve	(5)	
Number of square meters cleaned	Number of learners																		
100	700																		
350	200																		
700	100																		
1400	50																		
1750	40																		
3500	20																		

4.2	4.2.1	There must be enough space to manoeuvre especially when the disabled person is also the driver of the vehicle. ✓✓ (Accept any relevant answer.)	2:A	(2)
	4.2.2	Width of aisle = $0,4 \times 2\,500\text{ mm}$ = $1\,000\text{ mm}$ ✓ + $2\,500\text{ mm}$ ✓ = $3\,500\text{ mm}$ ✓	1:MA 1:M 1:A	(3)
	4.2.3	<p>Area of standard parking bay = $l \times b$ = $5\,000\text{ mm} \times 2\,500\text{ mm}$ = $\frac{12\,500\,000\text{ mm}^2}{1\,000\,000}$ ✓ = $12,5\text{ m}^2$ ✓</p> <p>Area of disabled parking bay = $l \times b$ = $5\,000\text{ mm} \times 3\,500\text{ mm}$ = $\frac{17\,500\,000\text{ mm}^2}{1\,000\,000}$ = $17,5\text{ m}^2$ ✓</p> <p>Difference = $17,5\text{ m}^2 - 12,5\text{ m}^2$ = 5 m^2 ✓</p> <p style="text-align: center;">OR</p> <p>Area of standard parking bay = $l \times b$ = $5\text{ m} \times 2,5\text{ m}$ ✓ = $12,5\text{ m}^2$ ✓</p> <p>Area of disabled parking bay = $l \times b$ = $5\text{ m} \times 3,5\text{ m}$ = $17,5\text{ m}^2$ ✓</p> <p>Difference = $17,5\text{ m}^2 - 12,5\text{ m}^2$ = 5 m^2 ✓</p>	1:C 1:A 1:A 1:MA 1:C 1:A 1:A 1:MA	(4)
				[25]

QUESTION 5				
5.1	5.1.1	Area of rectangle = Length x Breadth $1\,440\text{ cm}^2 = \text{length} \times 30\text{ cm} \checkmark$ $\text{Length} = \frac{1\,440\text{ cm}^2}{30\text{ cm}}$ $= 48\text{ cm} \checkmark$	1:SF 1:A	(2)
	5.1.2	Diameter = $\frac{30\text{ cm}}{5}$ $= 6\text{ cm} \checkmark$	1:A	(1)
	5.1.3	Length = $48 / 6$ $= 8 \checkmark$ Breadth = 5 Number of circles = $8 \times 5 \checkmark$ $= 40 \checkmark$	1:MA 1:M 1:A	(3)
.1	5.1.4	Wasted pastry = Area of rectangle – (Area of circle x 40) $= 1\,440\text{ cm}^2 - (\pi r^2 \times 40) \checkmark$ $= 1\,440\text{ cm}^2 - (3,14 \times 3^2 \times 40) \checkmark$ $= 1\,440\text{ cm}^2 - 1\,130,40\text{ cm}^2 \checkmark$ $= 309,60\text{ cm}^2 \checkmark$	1:F 1:M 1:S 1:A	(4)
5.2		10 dozen = 10×12 $= 120 \checkmark$ Mince filling = $120 \times 0,75$ $= 90 \checkmark$ Chicken filling = $120 - 90$ $= 30 \checkmark$ P(Chicken Filling) = $\frac{30}{120} \times \frac{29}{119} \checkmark$ $= \frac{870}{14\,280}$ $= \frac{29}{476} \checkmark$	1:MA 1:A 1:A 1:M 1:A	(5)
				[15]
			TOTAL:	150

