education

Department:
Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

MATHEMATICAL LITERACY P2

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MEMORANDUM

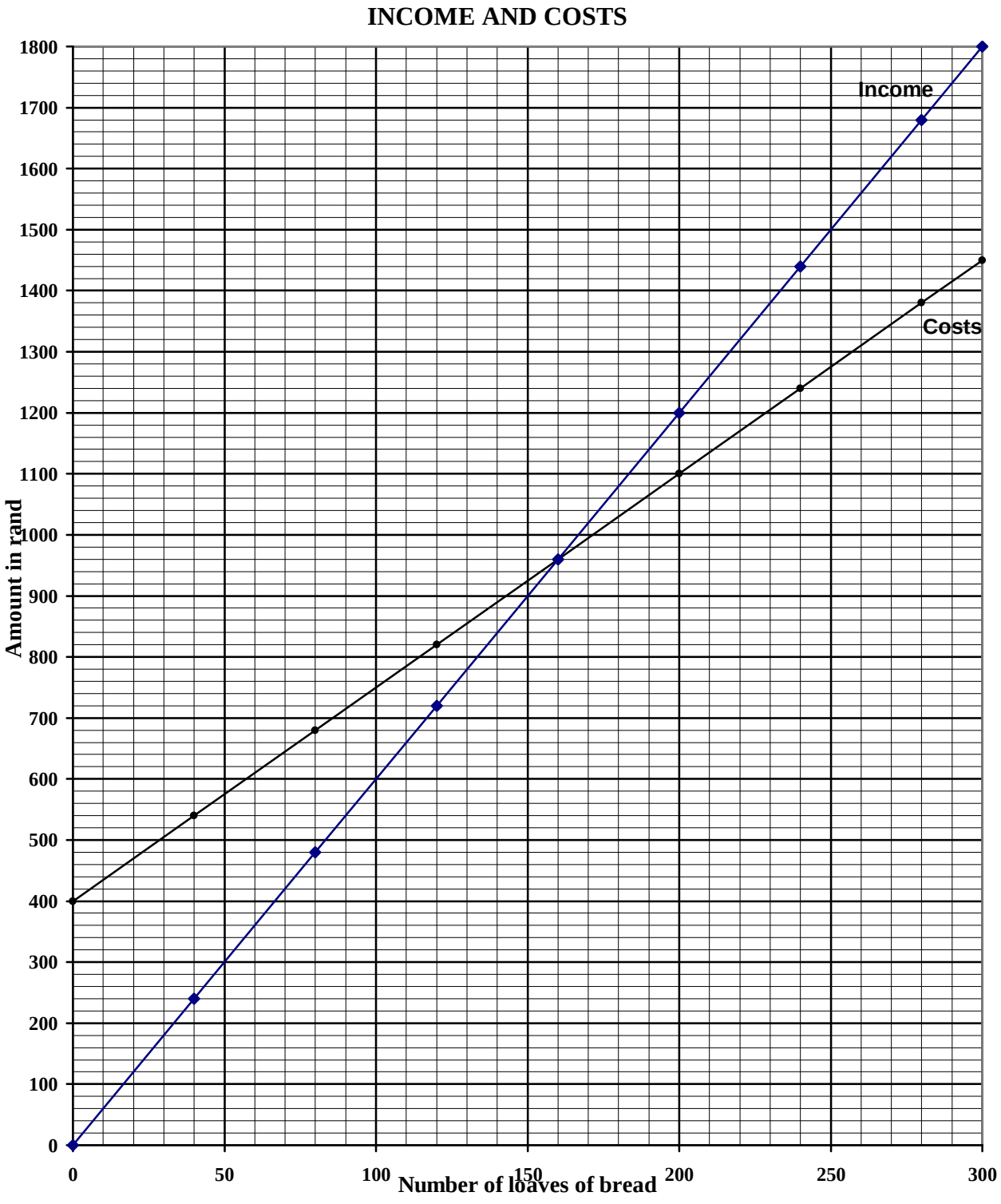
MARKS: 150

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

This memorandum consists of 16 pages.

QUESTION 1 [35]			
Ques	**AS**	**Solution**	**Explanation**
1.1	12.1.1 12.3.2	Number of loaves = $\frac{12{,}5\,\text{kg}}{450\,\text{g}}$ ✓M = $\frac{12500\,g}{450\,g}$ ✓C = 27,78 ✓CA ∴ 27 loaves ✓R **OR** ✓M ✓C Number of loaves = $\frac{12{,}5\,\text{kg}}{0{,}450\,\text{kg}}$ = 27,78 ✓CA ∴ 27 loaves ✓R	1M dividing 1C converting to grams 1CA simplification 1R rounding down **OR** 1M dividing 1C converting to kilograms 1CA simplification 1R rounding down (4)
1.2	12.2.1	Total cost = Fixed cost + (number of loaves × cost per loaf) **A** = 400 + (120 × R3,50) ✓SF = R820✓A **AND** 1 240 = 400 + (**B** × R3,50) ✓SF 840 = (**B** × R 3,50) 240 = **B** ✓A	1SF substitution 1A total cost 1SF substitution 1A number of loaves (4)
1.3	12.2.1	Income = number of loaves × price of loaf **C** = 120 × R6,00✓SF = R720,00✓A **AND** 960 = **D** × R6,00✓SF **D** = $\frac{960}{6}$ = 160 loaves ✓A	1SF substitution 1A income 1SF substitution 1A number of loaves (4)

Ques	AS	
1.4	12.2.2	



Explanation

1A 'cost' cutting y-axis at 400
1A 'income' starting at the origin
1CA point of intersection
1A labelling the graphs correctly
2A each graph is a straight line (solid or broken)
2A any other two points plotted correctly (8)

Ques	AS	Solution	Explanation
1.5.1	12.2.3	160 loaves must be sold ✓RG ✓ CA At this point both the cost and the income are the same and are equal to R960. ✓CA	1RG reading from graph 1CA income is R960 1CA cost is R960 (3)
1.5.2	12.2.3	R1 380 ✓✓RG	2RG reading from graph (CA from graph) (2)
1.5.3	12.2.3	125 loaves [Accept any whole number value between 120 and 130] ✓✓2RG	2RG reading from graph (CA from graph) (2)
1.5.4	12.2.3	Cost of making 300 loaves = R1 450 ✓RG Income from selling 250 loaves = R1 500 ✓RG Profit = R1 500 – R1 450 = R50 ✓CA	1RG reading cost from graph 1RG reading income from graph 1CA profit (CA from graph) (3)
1.6	12.2.1	The maximum number of batches per day = 6 ✓✓RT The maximum number of loaves baked each day = 6 × 20 loaves ✓M = 120 loaves ✓CA So, the order for 110 loaves may be accepted. ✓ CA	2RT reading from the time line 1M multiplying 1CA maximum number of loaves 1CA conclusion (5)

QUESTION 2 [21]			
Ques	**AS**	**Solution**	**Explanation**
2.1.1	12.1.3	Net monthly salary = $\frac{\text{R}144\,000}{12}$ ✓M = R12 000 ✓S	1M dividing 1S simplification (2)
2.1.2	12.1.3	Amount remaining each month = R12 000 – R8 400 = R3 600 ✓CA 90% of R3 600 = 0,9 × R3 600 ✓M = R3 240 ✓CA	1CA balance after expenses 1M Calculating 90% of savings 1CA saving per month (3)
2.2	12.1.3	F ? x = 3 000 $i = \frac{10{,}8\%}{12}$ = 0,009 per month ✓A n = 11 months✓A $F = \frac{x\left[(1+i)^n - 1\right]}{i}$ $= \frac{3\,000\left[(1+0{,}009)^{11} - 1\right]}{0{,}009}$ ✓SF ✓SF = R34 525,83✓CA	1A value of *i*. 1A value of n 2SF substitution 1CA final amount (5)

Ques	AS	Solution	Explanation
2.3	12.1.1	Increase = 10% of R12 000 $= \frac{10}{100} \times$ R12 000 ✓M = R1 200 ✓A New monthly salary = R12 000 + R1 200 ✓CA = R13 200 ✓CA **OR** Increase = 0,1 × R12 000 ✓M = R1 200 ✓A New monthly salary = R12 000 + R1 200 ✓CA = R13 200 ✓CA **OR** ✓M ✓A New monthly salary = 110% of R12 000 $= \frac{110}{100} \times$ R12 000✓M = R13 200 ✓A **OR** Annual increase = 10% of R144 000 $= \frac{10}{100} \times$R144 000✓M = R14 400 ✓A Annual new salary = R144 000 + R14 400 = R158 400 ✓CA New monthly salary = $\frac{158\ 400}{12}$ = R13 200✓CA	1M calculating 10% 1A actual increase 1CA adding increase 1CA new monthly salary 1M calculating 10% 1A actual increase 1CA adding increase 1CA new monthly salary 1M for 110% 1A original salary 1M multiplication 1A new salary 1M for 10% 1A increase in salary 1CA annual new salary 1CA new salary (4)
2.4	12.1.3	✓ M ✓M New monthly expenses = R8 400 + R3 900 – R700 = R11 600 ✓CA	1M adding new expense 1M subtracting public transport cost 1CA new monthly expenditure (3)

Ques	AS	Solution	Explanation
2.5	12.2.1	**Distance = speed × time** $\text{Speed} = \frac{\text{distance}}{\text{time}}$ ✓A $= \frac{18\text{ km}}{\frac{15}{60}\text{h}}$ ✓SF ✓C = 72 km/h ✓CA **OR** 15 minutes = 0,25 h ✓C $\text{Speed} = \frac{\text{distance}}{\text{time}}$ ✓A $= \frac{18\text{ km}}{0{,}25\text{h}}$ ✓SF = 72 km/h ✓CA	1A Changing subject 1SF substitution 1C converting to hours 1CA average speed 1C converting to hours 1A Changing subject 1SF substitution 1CA average speed (4)

QUESTION 3 [23]			
Ques	**AS**	**Solution**	**Explanation**
3.1.1	12.3.1	Surface Area $= 2\pi r^2 + 2\pi rh$ ✓SF $= 2 \times 3{,}14 \times (1\text{ m})^2 + 2 \times 3{,}14 \times 1\text{ m} \times 2\text{ m}$ $= 6{,}28\text{ m}^2 + 12{,}56\text{ m}^2$ ✓A $= 18{,}84\text{ m}^2$ ✓CA	1SF substitution 1A multiplication 1CA area (3)
3.1.2	12.1.1 12.2.1 12.3.1	Area to be painted = Surface area of tank + area of stand ✓M ✓CA $= 18{,}84\text{ m}^2 + 1\text{ m}^2 = 19{,}84\text{ m}^2$ 3 m^2 of surface needs 1ℓ $19{,}84\text{ m}^2$ of surface will need $\frac{19{,}84}{3}\ell$ ✓M $= 6{,}61333333\ldots\ell$ ✓CA $\therefore 7\ \ell$ of paint is needed ✓R	1M adding areas 1CA total area 1M dividing 1CA computation 1R rounding up (5)
3.1.3	12.1.1	OPTION 1 $7 \times 1\ell = 7 \times$ R23,63 ✓M = R165,41 OPTION 2 $1 \times 5\ell + 2 \times 1\ell$ = R113,15 + 2 × R23,63 ✓M = R160,41 ∴ It is more economical to buy 2 one litre tins and a 5 litre tin than to buy 7 one litre tins ✓CA	1M first option 1M second option 1CA conclusion (3)

Ques	AS	Solution	Explanation
3.2.1	12.3.1	$V = \pi r^2 h$ ✓SF $= 3{,}14 \times (1\text{ m})^2 \times 2\text{ m}$ ✓SF $= 6{,}28\text{ m}^3$ ✓A $= 6\,280\,\ell$ ✓C	1SF substituting r 1SF substituting h 1A computation 1C converting to ℓ (4)
3.2.2	12.1.1	In 1 hour the generator uses $\frac{72\,\ell}{36}$ ✓M $= 2\ \ell$ ✓A 7 days = 7 × 24 h = 168 h ✓C In 7 days the generator uses $168 \times 2\ \ell$ $= 336\ \ell$ ✓S Original amount of diesel = 80% of 6 280 ℓ $= \frac{80}{100} \times 6\,280\,\ell$ ✓M $= 5\,024\ \ell$ ✓S Amount of diesel remaining $= 5\,024\,\ell - 336\,\ell$ ✓M $= 4\,688\,\ell$ ✓S	1M finding rate 1A computation 1C converting to hrs 1S simplification 1M percentage 1S simplification 1M subtraction 1S simplification (8)

QUESTION 4 [21]			
Ques	**AS**	**Solution**	**Explanation**
4.1	12.4.4	Limpopo ✓RT	1RT correct province (1)
4.2.1	12.4.4	Gauteng and KwaZulu-Natal ✓A ✓A	1A Gauteng 1A KwaZulu-Natal (2)
4.2.2	12.4.4	Gauteng and KwaZulu-Natal ✓A ✓A	1A Gauteng 1A KwaZulu-Natal (2)
4.2.3	12.4.4	The higher the estimated million vehicle kilometres travelled, the higher the number of fatalities and vice versa. ✓✓J	2J description of relationship (2)
4.3.1	12.1.1 12.4.2	✓ RT Fatalities in Gauteng = $\frac{3\ 412}{15\ 392} \times 100\%$ ✓M = 22,17% ✓A	1RT reading Gauteng fatalities from the table 1M multiplying by 100% 1A percentage fatalities (3)
4.3.2 (a)	12.1.1 12.4.4	Gauteng: Number of fatalities per million vehicle kilometres travelled ✓M $= \frac{\text{number of fatalities in Gauteng in 2006}}{\text{number of million vehicle km travelled in Gauteng in 2006}}$ $= \frac{3\ 412}{44\ 042}$ ✓ RT✓ RT = 0,077✓ A	1M use of the correct formula 2RT correct reading from the table 1A solution (4)

Ques	AS	Solution	Explanation
4.3.2 (b)	12.1.1 12.4.4	Northern Cape ✓ A Number of fatalities per million vehicle kilometres travelled $= \frac{\text{number of fatalities}}{\text{number of million vehicle km travelled}}$ $= \frac{389}{2\,894}$ ✓ RT✓ RT = 0,134✓ CA	1A identifying the province 2RT correct reading from the table 1CA solution (4)
4.3.3	12.4.4	0,077 < 0,134 ✓ CA This means that fewer fatal accidents occur in Gauteng per million vehicle kilometres travelled than in Northern Cape. Gauteng is safest✓ J✓ J **OR** Any other similar or relevant answer.	1CA Calculation 2J Justification (3)

QUESTION 5 [25]			
Ques	**AS**	**Solution**	**Explanation**
5.1.1	12.3.4	C3 ✓A	1A correct grid reference (1)
5.1.2	12.3.4	South East ✓A	1A relative position (1)
5.1.3	12.3.4	Turn left into 4th Street ✓A Turn left into Buiten Street ✓A After passing Gerrie Visser Street turn right into the next street. You will see the petrol station ahead of you. ✓A **OR** Turn left into 4th Street Turn left into Wishart Street ✓A Turn right into Gerrie Visser Street ✓A Turn left into Buiten Street ✓A At the next street turn right. You will see the petrol station ahead of you. **OR** Turn in a northerly direction along 4th Street. ✓A Turn in a westerly direction along Buiten Street. ✓A After passing Gerrie Visser Street, turn in a northerly direction into the next street you come to. You will see the petrol station ahead of you. ✓A	1A direction in 4th St. 1A direction in Buiten St. 1A last turn into the garage 1A direction in Wishart 1A turn into Gerrie Visser St. 1A direction in Buiten St. and finding the garage 1A direction in 4th St. 1A direction in Buiten St. 1A last turn into the garage (3)
5.1.4 (a)	12.3.3	Distance = (26 + 40+ 24+ 20) mm ✓M = 110 mm ✓A = 11 cm ✓C	1M adding measurements 1A computation 1C converting to centimetres (3)
5.1.4 (b)	12.3.3	1 cm represents 11 000 cm ✓ M So, 11 cm = 11 000×11 cm ✓ M = 121 000 cm ✓CA = 1 210 m = 1,21 km ✓C	1M using scale in cm 1M multiplying by 11 1CA answer in cm 1C convert to kilometres (4)

Ques	AS	Solution	Explanation
5.2.1	12.4.3	Mean = ✓M $\frac{62+57+55{,}5+64+70+60+62+60+50+97+56+71+61+48+59{,}5+60+61}{17}$ $= \frac{1\,054}{17}$ ✓A = 62 km/h✓CA	1M formula 1A sum of scores 1CA mean (3)
5.2.2	12.4.3	Mode is 60 km/h ✓A	1A correct mode (1)
5.2.3	12.4.3	The speeds, written in order, are: ✓M✓A 48; 50; 55,5; 56; 57; 59,5; 60; 60; **60**; 61; 61; 62; 62; 64; 70; 71; 97 The median = 60 km/h✓A	1M ascending order 1A median position 1A value of median (3)
5.2.4	12.4.4	The mode and median speed are both 60 km/h. ✓J The mean speed is 62 km/h, but this speed is affected by the one fast driver who is driving at 97 km/h. ✓J So, it looks like most people stick to the speed limit. ✓J So their request for a stop street should be turned down. ✓J	4J justification (4)
5.2.5	12.4.4	Install speed bumps outside the school. ✓J Install flashing warning lights in the roads leading to the school✓J **OR** Have a scholar patrol. Any other suitable alternatives	2J justification (2)

QUESTION 6 [25]			
Ques	**AS**	**Solution**	**Explanation**
6.1.1	12.4.4	There is a steady increase in income ✓J✓J **OR** any other suitable explanation of trend.	2J Justification (2)
6.1.2	12.1.1 12.4.4	mean = $\frac{(3 + 3{,}5 + 4{,}5)\text{ hundred thousand}}{9}$ ✓M ✓A = $\frac{11\text{ hundred thousand}}{9}$ ✓S = 1,22 hundred thousand rand ✓CA **OR** R122 000	1M method 1A correct denominator 1S simplification 1CA solution (4)
6.1.3	12.4.6	Graph 2 ✓A The vertical scale starts at 2,5 and gives the impression that the quarterly increase is larger than it actually is. ✓J ✓J	1A answer 2J justification (3)
6.2.1 (a)	12.3.1	The bath covers 27 squares. ✓ M ✓ A One block is 20 cm by 20 cm 20 cm = $\frac{20}{100}$ m = 0,2 m ✓C 1 block = 0,2 m × 0,2 m = 0,04 m^2 ✓A The area under the bath = 27 × 0,04 m^2 ✓M = 1,08 m^2 ✓CA **OR** ✓M The length of the bath is 9 blocks = 9 × 20 cm = 180 cm ✓A = $\frac{180}{100}$ m = 1,8 m ✓C The width of the bath = 3 × 20 cm ✓C = 60 cm = 0,6 m Area under the bath = 1,8 m × 0,6 m ✓M = 1,08 m^2 ✓CA	1 M counting the blocks 1A correct counting 1C converting 1A area of 1 block 1M multiplying 1CA solution 1M counting blocks for length 1A length 1C converting 1C converting 1M multiplying 1CA solution (6)

6.2.1 (b)		Number of squares to be tiled = 54 ✓A ✓M 1 square = 0,2 m ×0,2 m = 0,04 m^2 ✓C 54 squares = 54 ×0,04 m^2 ✓M = 2,16 m^2 ✓CA **OR** Length of bathroom = 10 × 20 cm = 200 cm = 2 m ✓C Breadth of the bathroom = 9× 20 cm = 180 cm = 1,8 m Area of bathroom = 2 m × 1,8 m ✓M = 3,6 m^2 ✓A Length of basin = 60 cm = 0,6 Width of the basin = 3 × 20 cm = 30 cm = 0,6 m Area under the basin = 0,6 m × 0,6 m ✓CA Area to be tiled = 3,6 m^2 – (1,08 m^2 + 0, 36 m^2) = 2,16 m^2 ✓CA **OR** Size of bathroom = 9 × 10 squares = 90 squares ✓M ✓A Size of the bath = 3 × 9 squares = 27 squares ✓A Size of wash basin = 3 × 3 squares = 9 squares ✓A Area to be tiled = 90 – 27 – 9 = 54 squares Area = 54× 0,2 m ×0,2 m = 2,16 m^2 ✓CA	1 M counting the blocks 1A correct counting 1C area of block in m^2 1M multiplying 1CA solution **OR** 1C converting 1M substitution into area formula 1A solution 1CA area under basin 1CA solution 1M multiplication 1A size of room 1A size of bath 1A size of wash basin 1CA solution (5)

6.2.2	12.1.1	Number of square metres of tiles needed = (2,16 + 10% of 2,16) m^2 ✓M = $(2{,}16 + \frac{10}{100} \times 2{,}16)\ m^2$ ✓A = (2,16 + 0,216) m^2 = 2,376 m^2 ✓CA Number of boxes of tiles = $\frac{2{,}376}{1{,}5}$ ✓M = 1,574 boxes = 2 boxes ✓R **OR** Number of boxes of tiles = $\frac{2{,}16}{1{,}5}$ ✓M = 1,44 boxes ✓CA 10% extra = $\frac{10}{100} \times 1{,}44 = 0{,}144$ ✓A ✓CA Number of boxes = 1,44 + 0,144 = 1,584 = 2 boxes ✓R **OR** Number of boxes of tiles = $\frac{2{,}16}{1{,}5}$ ✓M = 1,44 boxes ✓CA 110% × 1,44 = $\frac{110}{100} \times 1{,}44 = 1{,}584$ ✓A ✓CA = 2 boxes ✓R	1M method 1A calculating % 1CA simplification 1M dividing 1R Rounding up **OR** 1M method 1CA simplification 1A calculating % 1CA Solution 1R rounding up **OR** 1M method (division) 1CA Solution 1A calculating % 1CA simplification 1R Rounding up (5)

TOTAL: 150