



education

Department:
Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

MATHEMATICAL LITERACY P1

FEBRUARY/MARCH 2009

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
SF	Substitution in a formula
P	Penalty, e.g. for no units, incorrect rounding off etc.
R	Rounding

This memorandum consists of 11 pages.

QUESTION 1 [30]			
Ques	AS	Solution	Explanation
1.1.1	12.1.1	$47\% = \frac{47}{100} \checkmark A$	1A writing as a proper fraction (1)
1.1.2	12.1.1	$\frac{78 \div 6}{120 \div 6} \checkmark M$ $= \frac{13}{20}$ $= 0,65 \checkmark A$ OR $120 \overline{)0,65} \checkmark A \checkmark A$	1M dividing numerator and denominator by 6 1A simplification as a decimal 1M dividing 1A simplification as a decimal (2)
1.1.3	12.1.1	$1,2 \text{ m} + (23,5 \text{ m} \times 5) - 4,7 \text{ m}$ $= 1,2 \text{ m} + 117,5 \text{ m} - 4,7 \text{ m} \checkmark A$ $= 114,0 \text{ m} \checkmark A$	1A simplifying within brackets 1A simplification (2)
1.1.4	12.1.1	$\frac{1}{3} \times (3)^3 + \sqrt{64} = \frac{1}{3} \times 27 + 8 \checkmark A$ $= 9 + 8$ $= 17 \checkmark CA$	1A simplifying exponent 1A simplifying square root 1CA simplification (3)
1.1.5	12.1.3	VAT = 14% of R24 650,00 $= \frac{14}{100} \times R 24 650,00 \checkmark M$ $= R3 451,00 \checkmark A$ OR $0,14 \times R24 650,00 \checkmark M$ $= R3 451,00 \checkmark A$	1M writing 14% as a fraction or as a decimal 1A simplification (2)
1.1.6	12.1.3	$R1 = \text{€}0,11$ $R1 500 = 1 500 \times \text{€} 0,11 \checkmark M$ $= \text{€} 165 \checkmark A$	1M multiplication 1A simplification (2)

1.1.7	12.1.1	R1 250,00 increased by 24% $= R1\ 250,00 + 24\% \text{ of } R1\ 250,00 \checkmark M$ $= R1\ 250 + R3\ 00 \checkmark A$ $= R1\ 550 \checkmark CA$ OR $R1\ 250,00 \times 124\% \checkmark M$ $= R1\ 250,00 \times 1,24 \checkmark A$ $= R1\ 550 \checkmark CA$	1M adding 24% of amount 1A calculating 24% of amount 1CA increased amount 1M for 124% 1A writing 124% as a decimal 1CA increased amount (3)
1.1.8	12.1.1 12.3.2	Number of portions of jam $= \frac{450g}{30g} \checkmark A$ $= 15 \checkmark A$	1A Dividing 1A simplification (2)
1.1.9	12.2.1	Cost $= 6 \times R12,15 \checkmark A$ $= R72,90 \checkmark A$	1A substitution 1A simplification (2)
1.2.1	12.2.3	07:00 (7 am) $\checkmark A$	1A starting time (1)
1.2.2	12.2.3	6 km $\checkmark A \checkmark A$	2A Correct distance (2)
1.2.3	12.2.3	$16\frac{1}{2}$ km or 16,5 km $\checkmark A \checkmark RG$	1A distance 1RG reading from the graph (2)
1.2.4	12.2.3	She had walked 9 km by 08:30 $\checkmark$ Time taken $= 08:30 - 07:00$ $= 1,5 \text{ hrs or } 1\frac{1}{2} \text{ hrs} \checkmark$	1A correct reading 1S simplification ANSWER ONLY – FULL MARKS (2)
1.2.5	12.2.3	She had walked for 09:00 – 07:00 $\checkmark RG$ $= 2\text{hrs} \checkmark S$	1RG Reading from graph 1S simplification (2)
1.2.6	12.2.3	She finished just before 10:30 $\checkmark \checkmark CA$ OR She finished at approximately 10:28. (accept any answer after 10:15 but before 10:30)	2CA estimation (2)

QUESTION 2 [30]			
Ques	AS	Solution	Explanation
2.1.1	12.3.1	$\text{Area} = \pi r^2$ $= 3,14 (1,5 \text{ m})^2 \checkmark \text{A}$ $= 7,065 \text{ m}^2 \checkmark \text{A}$ $= 7,07 \text{ m}^2 \checkmark \text{CA}$	1S substitution 1A calculation 1CA rounding off correctly (3)
2.1.2	12.3.1	$P = 2(l + b)$ $= 2(6 + 4) \text{ m} \checkmark \text{A}$ $= 20 \text{ m} \checkmark \text{A}$	1A substitution 1A calculation (2)
2.1.3	12.3.2	$6\text{m} = 6 \times 3,25 \text{ feet} \checkmark \text{SF}$ $= 19,5 \text{ feet} \checkmark \text{S}$	1SF Substitution 1S simplification (2)
2.2.1	12.1.1 12.4.4	$\text{Mpumalanga} = \frac{7}{70} \times 100\% \checkmark \text{M}$ $= 10\% \checkmark \text{S}$	1M method 1S simplification (2)
2.2.2	12.1.1 12.4.4	$\text{Gauteng : Northern Cape} = 10 : 5 \checkmark \text{A}$ $= 2 : 1 \checkmark \text{S}$	1A Order 1S simplification (2)
2.2.3(a)	12.4.5	$P(\text{learner from Eastern Cape})$ $= \frac{\text{number of learners from Eastern Cape}}{\text{total number of learners}} \checkmark \text{M}$ $= \frac{8}{70} \text{ OR } \frac{4}{35} \text{ OR } 0,114 \text{ OR } 11,43\% \checkmark \text{S}$	1M method 1S simplification (2)
2.2.3(b)	12.4.5	$\text{The probability that the learner comes from South Africa}$ $= \frac{\text{number of learners from South Africa}}{\text{total number of learners}} \checkmark \text{M}$ $= \frac{70}{70} \text{ OR } 1 \text{ OR } 100\% \checkmark \text{S}$	1M method 1S simplification (2)

Quest	Ass	Solution	Explanation																				
2.2.4	12.4.2	NUMBER OF WINNERS ATTENDING THE YOUTH FORUM <table><caption>Data for NUMBER OF WINNERS ATTENDING THE YOUTH FORUM</caption><thead><tr><th>Name of province</th><th>Number of learners</th></tr></thead><tbody><tr><td>EC</td><td>8</td></tr><tr><td>FS</td><td>6</td></tr><tr><td>GP</td><td>10</td></tr><tr><td>KZN</td><td>11</td></tr><tr><td>LP</td><td>8</td></tr><tr><td>MP</td><td>7</td></tr><tr><td>NC</td><td>5</td></tr><tr><td>NWP</td><td>6</td></tr><tr><td>WC</td><td>9</td></tr></tbody></table>	Name of province	Number of learners	EC	8	FS	6	GP	10	KZN	11	LP	8	MP	7	NC	5	NWP	6	WC	9	1M graph with bars 4A For all provinces correct (– 1A for 1 or 2 provinces not correct) (–2A for 3 or 4 provinces not correct) (–3A for 5 or 6 provinces not correct) (–4A for 7 or 8 provinces not correct) (P1 for bars meeting/no spaces between) (5)
Name of province	Number of learners																						
EC	8																						
FS	6																						
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LP	8																						
MP	7																						
NC	5																						
NWP	6																						
WC	9																						
2.3.1	12.4.4	91,3% ✓ RT/RG	1 RT/RG Reading from table/graph (1)																				
2.3.2	12.1.1	The increase = 96,3% - 93,6% ✓M✓ RT = 2,7% ✓S	1 RT/RG Reading from table/graph 1M method 1S simplification (3)																				
2.3.3(a)	12.4.4	13-year-olds ✓RT/RG	1 RT/RG Reading from table/graph (1)																				
2.3.3(b)	12.4.4	7-year-olds ✓ RT/RG	1RT/RG Reading from table/graph (1)																				
2.3.3(c)	12.4.4	7-year-olds ✓✓ RT/RG	2RT/RG Reading from table/graph (2)																				
2.3.4		$91,3\% \text{ of } 240\,000 = \frac{91,3}{100} \times 240\,000 \checkmark \text{ M}$ $= 219\,120 \text{ learners} \checkmark \text{ CA}$	1M calculating % 1CA solution (2)																				

QUESTION 3 [20]			
Ques	AS	Solution	Explanation
3.1	12.3.1	$\text{Area} = 40 \text{ cm} \times 30 \text{ cm} \checkmark \text{SF}$ $= 1\,200 \text{ cm}^2 \checkmark \text{A}$	1SF substitution in formula 1A Calculation (2) ANSWER ONLY – FULL MARKS
3.2.1	12.3.1	$\text{S.A} = (2\pi \times r \times h) + (2\pi \times r^2)$ $\checkmark \text{SF} \quad \checkmark \text{SF}$ $=$ $(2 \times 3,14 \times 6 \text{ cm} \times 15 \text{ cm}) + (2 \times 3,14 \times (6 \text{ cm})^2)$ $= 565,2 \text{ cm}^2 + 226,08 \text{ cm}^2 \checkmark \text{S}$ $= 791,28 \text{ cm}^2 \checkmark \text{CA}$	2SF substitution in formula 1S simplification 1CA solution (4) ANSWER ONLY – FULL MARKS
3.2.2	12.3.1	$\checkmark \text{SF} \quad \checkmark \text{SF}$ $\text{S.A} = (2 \times 15 \times 8) + (2 \times 15 \times 15) + (2 \times 8 \times 15) \text{ cm}^2$ $= (240 + 450 + 240) \text{ cm}^2 \checkmark \text{S}$ $= 930 \text{ cm}^2 \checkmark \text{CA}$	2SF substitution in formula 1S simplification 1CA solution (4) ANSWER ONLY – FULL MARKS
3.2.3	12.3.1	$\checkmark \text{SF} \quad \checkmark \text{SF}$ $\text{V} = 3,14 \times (6 \text{ cm})^2 \times 15 \text{ cm}$ $= 1\,695,6 \text{ cm}^3 \checkmark \text{A}$	2SF substitution in formula 1A solution (3) ANSWER ONLY – FULL MARKS
3.3.1	12.1.3	$\checkmark \text{A} \quad \checkmark \text{M}$ $\text{Percentage profit} = \frac{\text{R } 4,50}{\text{R } 25,50} \times 100\%$ $= 17,65\% \checkmark \text{A} \checkmark \text{CA}$	1M multiplying by 100% 1A correct cost 1A percentage profit 1CA rounding (4)
3.3.2	12.1.1	$\text{Number of boxes} = \frac{\text{R } 400,00}{\text{R } 4,50} \checkmark \text{A}$ $= 88,89 \checkmark \text{A}$ The number of boxes to be sold is 89. $\checkmark \text{CA}$ OR Learners can apply logical reasoning of counting e.g. 100 boxes will bring in R450,00 10 boxes will bring in R45,00 $\checkmark \text{A}$ 90 boxes will bring in R405,00 $\checkmark \text{A}$ $\therefore \text{R } 405,00 - \text{R } 4,50 = \text{R } 400,50$ Thus he needs to sell 89 boxes. $\checkmark \text{CA}$ Any alternative like above.	1A dividing by profit per box 1A computation 1CA rounding up 1A multiplication 1A 90 boxes 1CA deducing 89 boxes (3)

QUESTION 4 [16]			
Ques	AS	Solution	Explanation
4.1	12.2.3	Thursday ✓✓A	2A working out the day (2)
4.2	12.3.1	14:50 (Thursday) – 18:30 (Wednesday) = 20 hours and 20 minutes ✓A = $20 + \frac{20}{60}$ hours ✓CA = 20,33 hours OR $20\frac{1}{3}$ hours ✓CA	1A calculating the number of hours in hours and minutes 1CA converting minutes to hours 1CA answer (3)
4.3	12.3.1	00:33 + 27 minutes ✓A = 01:00 ✓A	1A adding 27 minutes 1A departure time (2)
4.4	12.3.1 12.3.2	17 + 27 + 30 + 20 + 30 + 2 + 2 + 2 + 2 + 30 ✓A = 162 minutes ✓A = 2 hours 42 minutes ✓CA	1A addition 1A sum in minutes 1CA converting to hours and minutes (3)
4.5	12.2.1	Average speed = $\frac{\text{distance}}{\text{time}}$ Average speed = $\frac{842 \text{ km}}{17,6 \text{ h}}$ ✓SF = 47,84 km/h ✓A ✓CA	1SF substitution 1A speed 1CA rounding off (3)
4.6	12.3.1	Arrival time of the train = 10:25 ✓RT Assume the time lost between the train's arrival and getting off the train is negligible. Walking time = 5 minutes Arrival time at bus station = 10:30. ✓CA ∴ James will be at the bus station in plenty of time. ✓CA	1 RT reading arrival time 1CA adding walking time 1CA conclusion (3)

QUESTION 5 [20]			
Ques	AS	Solution	Explanation
5.1.1	12.4.4	Aluminium cans ✓RT	1RT reading from table (1)
5.1.2	12.4.4	Paper/Cardboard ✓RT	1RT reading from table (1)
5.2.1	12.4.4	Chart A ✓✓RT	2RT reading from the table (2)
5.2.2	12.4.4	Motor oil ✓✓RT	2RT reading from the table (2)
5.3	12.1.1 12.4.4	$\text{Percentage} = \frac{\overset{\checkmark\text{RT}}{581000}}{640500} \times 100\% \checkmark\text{M}$ $= 90,7\% \checkmark\text{CA} \checkmark\text{CA}$	1RT reading from table 1M calculating % 1CA simplification 1CA correct rounding off (4)
5.4.1	12.1.1	$935\,000 : 2\,144\,000 \checkmark\text{M}$ $= 935: 2\,144 \checkmark\text{A}$	1M Expressing as a ratio 1A simplification (2)
5.4.2	12.1.1	$\text{No. of trees} = 935\,000 \times 17 \checkmark\text{M}$ $= 15\,895\,000 \checkmark\text{A}$	1M finding no. of trees 1A number of trees (2)
5.4.3	12.1.1	$\text{No. of tons} = 43\% \times 2\,560\,000 \checkmark\text{M}$ $= 1\,100\,800 \checkmark\text{A}$	1M finding no. of tons 1A no. of tons (2)
5.5	12.2.1	$A = \overset{\checkmark\text{SF}}{(200 \times \text{R}3,00)} + \overset{\checkmark\text{SF}}{(200 \times \text{R}3,50)} + \overset{\checkmark\text{SF}}{(250 \times \text{R}4,00)}$ $= \text{R}600 + \text{R}700 + \text{R}1\,000$ $= \text{R}2\,300 \checkmark\text{A}$	3SF substitution 1A simplification (4)

QUESTION 6 [19]			
Ques	AS	Solution	Explanation
6.1.1 (a)	12.2.3	R2 000 ✓RG	1RG reading from graph (1)
6.1.1 (b)	12.2.3	R2 900 ✓✓RG	2 RG reading from graph (2)
6.1.2	12.2.3	Total distance = 1 500 km ✓✓RG	2 RG reading from graph (2)
6.2	12.2.1	Petrol bill = $\frac{\text{Number of kilometres travelled}}{10} \times \text{cost of 1 } \ell \text{ of petrol}$ $= \frac{1400}{10} \times R10,40 \text{ ✓SF}$ $= 140 \times R10,40 \text{ ✓A}$ $= R1\,456,00 \text{ ✓CA}$	1SF substitution into formula 1A simplification 1CA petrol bill (3)
6.3.1	12.2.3	Time = $\frac{360 \text{ km}}{30 \text{ km per h}} \text{ ✓M}$ A = 12 ✓A Speed = $\frac{360 \text{ km}}{6 \text{ h}} \text{ ✓M}$ B = 60 km/h ✓A	1M division 1A value of A 1M division 1A value of B (4)

6.3.2	12.2.2	TIME TAKEN TO TRAVEL 360 km 4A any four points plotted correctly 1A smooth curve (5)	
6.4	12.1.1	Amount each will pay = $\frac{R4\ 236}{6}$ ✓M = R706,00 ✓A	1M dividing by 6 1A for solution (2)

QUESTION 7 [15]			
7.1.1	12.1.1	$\text{Percentage} = \frac{1}{9} \times 100\% \checkmark \mathbf{A}$ $= 11,11\% \checkmark \mathbf{CA}$	1M calculating percentage 1A number of times 1CA percentage (3)
7.1.2	12.4.3	50,48 seconds $\checkmark \mathbf{A}$	1A median (1)
7.1.3	12.4.3	Range = 52,54 seconds – 49,21 seconds $\checkmark \mathbf{A}$ = 3,33 seconds $\checkmark \mathbf{A}$	1A subtraction 1A range (2)
7.2.1	12.1.1	49,20; 49,21; 50,26; 50,56; 50,58 ; 51,24; 51,24; 52,56 $\checkmark \checkmark \mathbf{A}$ Median = 50,57 $\checkmark \mathbf{A}$	2A ascending order 1A median (3)
7.2.2	12.4.3	51,24 seconds $\checkmark \mathbf{A}$	1A mode (1)
7.2.3	12.4.3	Mean = $\frac{404,85 \text{ seconds}}{8} \checkmark \mathbf{M} \checkmark \mathbf{A}$ = 50,61 seconds $\checkmark \mathbf{CA}$	1M finding the mean 1A correct addition 1CA correctly rounded off mean (3)
7.2.4	12.4.5	$P(\text{less than } 49,23) = \frac{2}{8} \text{ OR } \frac{1}{4} \text{ OR } 0,25 \text{ OR } 25\% \checkmark \mathbf{A}$	1A substitution 1A fraction/decimal/percentage (2)

TOTAL: 150