education

Department:
Education
REPUBLIC OF SOUTH AFRICA

NATIONAL
SENIOR CERTIFICATE

GRADE 12

MATHEMATICAL LITERACY P1

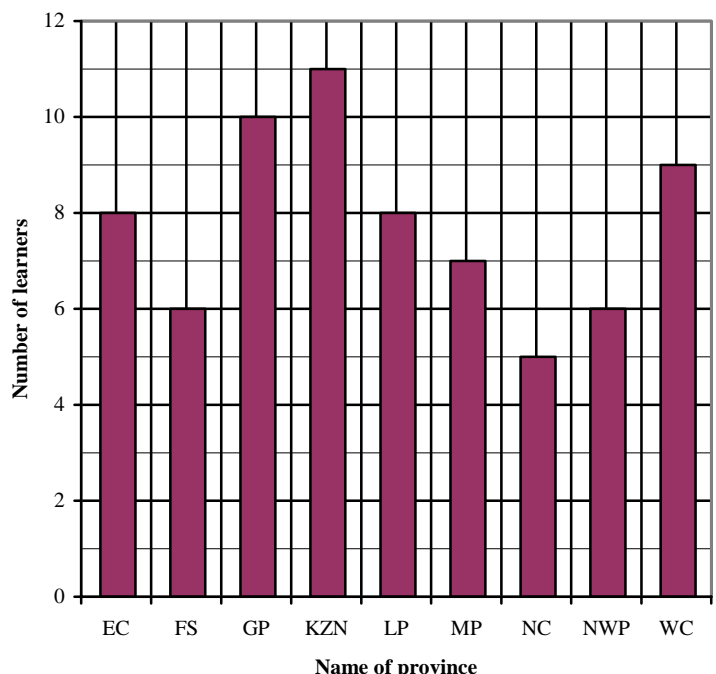**FEBRUARY/MARCH 2009**

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	$47\% = \dfrac{47}{100}$ ✓ A	1A writing as a proper fraction (1)
1.1.2	12.1.1	$\dfrac{78 \div 6}{120 \div 6}$ ✓ M $= \dfrac{13}{20}$ $= 0{,}65$ ✓ A **OR** $120 \overline{)78}^{\,0{,}65}$ ✓ A✓ 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	$1{,}2$ m $+ (23{,}5$ m $\times 5) - 4{,}7$ m $= 1{,}2$ m $+ 117{,}5$ m $- 4{,}7$ m ✓ A $= 114{,}0$ m ✓ A	1A simplifying within brackets 1A simplification (2)
1.1.4	12.1.1	$\dfrac{1}{3} \times (3)^3 + \sqrt{64}\ \overset{\checkmark A}{=}\ \dfrac{1}{3} \times 27 + 8$ ✓A $\qquad\qquad = 9 + 8$ $\qquad\qquad = 17$ ✓ CA	1A simplifying exponent 1A simplifying square root 1CA simplification (3)
1.1.5	12.1.3	VAT $= 14\%$ of R24 650,00 $\qquad = \dfrac{14}{100} \times$ R 24 650,00 ✓ M $\qquad =$ R3 451,00 ✓ A **OR** $\quad 0{,}14 \times$ R24 650,00 ✓M $\qquad =$ R3 451,00 ✓ A	1M writing 14% as a fraction or as a decimal 1A simplification (2)
1.1.6	12.1.3	R1 = €0,11 R1 500 = 1 500 × €0,11 ✓ M $\qquad = €165$ ✓ A	1M multiplication 1A simplification (2)

1.1.7	12.1.1	R1 250,00 increased by 24% = R1 250,00 + 24% of R1 250,00 ✓ M = R1 250 + R3 00 ✓ A = R1 550 ✓ CA **OR** R1 250,00 × 124% ✓ M = R1 250,00 × 1,24 ✓ A = R1 550 ✓ 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 = $\dfrac{450g}{30g}$ ✓ A = 15 ✓ A	1A Dividing 1A simplification (2)
1.1.9	12.2.1	Cost = 6 × R12,15 ✓ A = R72,90 ✓ A	1A substitution 1A simplification (2)
1.2.1	12.2.3	07:00 (7 am) ✓A	1A starting time (1)
1.2.2	12.2.3	6 km✓A ✓A	2A Correct distance (2)
1.2.3	12.2.3	$16\dfrac{1}{2}$ km or 16,5 km ✓A✓RG	1A distance 1RG reading from the graph (2)
1.2.4	12.2.3	She had walked 9 km by 08:30✓ Time taken = 08:30 – 07:00 = 1,5 hrs or $1\dfrac{1}{2}$ hrs✓	1A correct reading 1S simplification **ANSWER ONLY – FULL MARKS** (2)
1.2.5	12.2.3	She had walked for 09:00 – 07:00 ✓RG = 2hrs✓S	1RG Reading from graph 1S simplification (2)
1.2.6	12.2.3	She finished just before 10:30✓✓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	Area $= \pi r^2$ $= 3{,}14 (1{,}5 \text{ m})^2$ ✓A $= 7{,}065 \text{ m}^2$ ✓A $= 7{,}07 \text{ m}^2$ ✓CA	1S substitution 1A calculation 1CA rounding off correctly (3)
2.1.2	12.3.1	$P = 2(l + b)$ $= 2(6 + 4) \text{ m}$ ✓A $= 20 \text{ m}$ ✓A	1A substitution 1A calculation (2)
2.1.3	12.3.2	$6m = 6 \times 3{,}25 \text{ feet}$✓SF $= 19{,}5 \text{ feet}$✓S	1SF Substitution 1S simplification (2)
2.2.1	12.1.1 12.4.4	Mpumalanga $= \dfrac{7}{70} \times 100\%$✓ M $= 10\%$✓ S	1M method 1S simplification (2)
2.2.2	12.1.1 12.4.4	Gauteng : Northern Cape $= 10 : 5$✓ A $= 2 : 1$✓ S	1A Order 1S simplification (2)
2.2.3(a)	12.4.5	P(learner from Eastern Cape) $= \dfrac{\text{number of learners from Eastern Cape}}{\text{total number of learners}}$ ✓ M $= \dfrac{8}{70}$ **OR** $\dfrac{4}{35}$ **OR** $0{,}114$ **OR** $11{,}43\,\%$✓ S	1M method 1S simplification (2)
2.2.3(b)	12.4.5	The probability that the learner comes from South Africa $= \dfrac{\text{number of learners from South Africa}}{\text{total number of learners}}$ ✓ M $= \dfrac{70}{70}$ **OR** 1 **OR** 100%✓ S	1M method 1S simplification (2)

Quest	Ass	Solution	Explanation
2.2.4	12.4.2	**NUMBER OF WINNERS ATTENDING THE YOUTH FORUM** 	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)
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		$91,3\%$ of $240\,000 = \dfrac{91,3}{100} \times 240\,000$✓ M = 219 120 learners✓CA	1M calculating % 1CA solution (2)

QUESTION 3 [20]			
Ques	**AS**	**Solution**	**Explanation**
3.1	12.3.1	Area = 40 cm × 30 cm ✓SF = 1 200 cm^2 ✓ A	1SF substitution in formula 1A Calculation (2) **ANSWER ONLY – FULL MARKS**
3.2.1	12.3.1	S.A = $(2\pi \times r \times h) + (2\pi \times r^2)$ ✓SF ✓ SF = $(2 \times 3,14 \times 6\,cm \times 15\,cm) + (2 \times 3,14 \times (6\,cm)^2)$ = 565,2 cm^2 **+** 226,08 cm^2 ✓S = 791,28 cm^2 ✓CA	2SF substitution in formula 1S simplification 1CA solution (4) **ANSWER ONLY – FULL MARKS**
3.2.2	12.3.1	✓SF ✓SF S.A = $(2 \times 15 \times 8) + (2 \times 15 \times 15) + (2 \times 8 \times 15)$ cm^2 = $(240 + 450 + 240)$ cm^2 ✓S = 930 cm^2 ✓CA	2SF substitution in formula 1S simplification 1CA solution (4) **ANSWER ONLY – FULL MARKS**
3.2.3	12.3.1	✓SF ✓SF V = 3,14 $\times (6\,cm)^2 \times 15$ cm = 1 695,6 cm^3 ✓A	2SF substitution in formula 1A solution **ANSWER ONLY – FULL MARKS** (3)
3.3.1	12.1.3	✓A ✓M Percentage profit = $\dfrac{R\,4,50}{R\,25,50} \times 100\%$ = 17,65% ✓A ✓CA	1M multiplying by 100% 1A correct cost 1A percentage profit 1CA rounding (4)
3.3.2	12.1.1	Number of boxes = $\dfrac{R\,400,00}{R\,4,50}$ ✓A = 88, 89 ✓A The number of boxes to be sold is 89. ✓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✓A 90 boxes will bring in R405,00✓A ∴ R405,00 – R4,50 = R400,50 Thus he needs to sell 89 boxes. ✓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 $= 20 + \dfrac{20}{60}$ hours ✓CA = 20,33 hours **OR** $20\dfrac{1}{3}$ 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 $= \dfrac{\text{distance}}{\text{time}}$ Average speed $= \dfrac{842 \text{ km}}{17,6 \text{ h}}$ ✓SF $\qquad\qquad$ = 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	$\text{Percentage} = \dfrac{\overset{\checkmark \textbf{RT}}{581\,000}}{640\,500} \times 100\%$ ✓**M** $= 90{,}7\%$ ✓**CA**✓**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 ✓**M** = 935: 2 144 ✓**A**	1M Expressing as a ratio 1A simplification (2)
5.4.2	12.1.1	No. of trees = 935 000 × 17 ✓**M** = 15 895 000 ✓**A**	1M finding no. of trees 1A number of trees (2)
5.4.3	12.1.1	No. of tons = 43% × 2 560 000 ✓**M** = 1 100 800 ✓**A**	1M finding no. of tons 1A no. of tons (2)
5.5	12.2.1	A = (200 ×R3,00)$^{\checkmark SF}$ + (200 ×R3,50)$^{\checkmark SF}$ + (250 ×R4,00)$^{\checkmark SF}$ = R600 + R700 + R1 000 = R2 300 ✓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 =** $\dfrac{\text{Number of kilometres travelled}}{10} \times \text{cost of } 1\,\ell \text{ of petrol}$ $= \dfrac{1\,400}{10} \times \text{R10,40}$ ✓**SF** $= 140 \times \text{R10,40}$ ✓**A** $= \text{R1 456,00}$ ✓**CA**	1SF substitution into formula 1A simplification 1CA petrol bill (3)
6.3.1	12.2.3	$\text{Time} = \dfrac{360\,\text{km}}{30\,\text{km per h}}$ ✓**M** $A = 12$ ✓**A** $\text{Speed} = \dfrac{360\,\text{km}}{6\,\text{h}}$ ✓**M** $B = 60\,\text{km/h}$ ✓**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**

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 = $\dfrac{\text{R4 236}}{6}$ ✓**M** = R706,00✓**A**	1M dividing by 6 1A for solution (2)

QUESTION 7 [15]			
7.1.1	12.1.1	$$\text{Percentage} = \frac{1}{9} \times 100\% \quad \checkmark\mathbf{M} \quad \checkmark\mathbf{A}$$ $$= 11,11\% \quad \checkmark\mathbf{CA}$$	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 $\checkmark\mathbf{A}$ $\quad\quad$ = 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	$$\text{Mean} = \frac{404,85 \text{ seconds}}{8} \quad \checkmark\mathbf{M}\checkmark\mathbf{A}$$ $$= 50,61 \text{ seconds} \quad \checkmark\mathbf{CA}$$	1M finding the mean 1A correct addition 1CA correctly rounded off mean (3)
7.2.4	12.4.5	P(less than 49,23) = $\frac{2}{8}$ **OR** $\frac{1}{4}$ **OR** 0,25 **OR** 25%$\checkmark\mathbf{A}$	1A substitution 1A fraction/decimal/ percentage (2)

TOTAL: **150**