basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

MATHEMATICAL LITERACY P2

FEBRUARY/MARCH 2015

MEMORANDUM

MARKS: 150

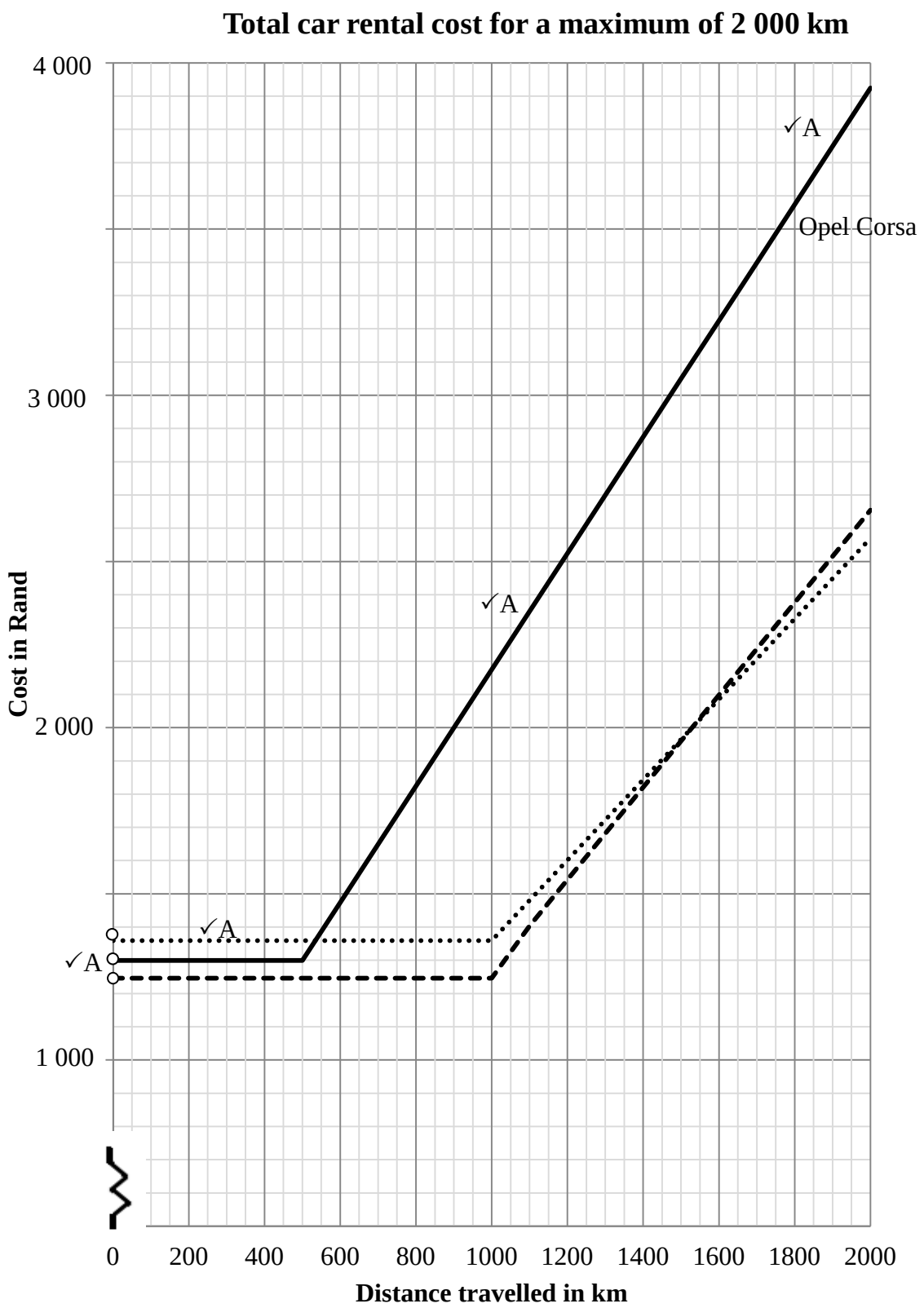
Symbol	Explanation
M	Method
M/A	Method with accuracy
CA	Consistent accuracy
A	Accuracy
C	Conversion
S	Simplification
RT/RG	Reading from a table/Reading from a graph
SF	Correct substitution in a formula
O	Opinion/Example
P	Penalty, e.g. for no units, incorrect rounding off, etc.
R	Rounding off
NPR	No penalty for rounding

This memorandum consists of 14 pages.

QUESTION 1 [37 MARKS]			
Ques	**Solution**	**Explanation**	**Level**
1.1	Rental: R 12 600 ✓RT Salaries: R 9 715 ✓MA + R 6 556 = R 16 271 ✓CA Packaging R 965,00 × 46,425% = R 448,00 ✓M ∴ R965,00 – R448,00 = R517,00 ✓CA **OR** R 965,00 × (100% – 46,425%) ✓M = R 517,00 ✓CA Telephone: R 240 × $\frac{11}{8}$ = R330 ✓MA ✓CA Transport cost: = R 34 238 – (R 16 271 + R 517 + R 330 + R 12 600) ✓M ✓MA = R 4 520 ✓CA	1RT Correct rental amount 1MA adding 1CA total salaries 1M multiplying % 1CA decreased packaging cost 1M increase in given ratio 1CA telephone cost 1M subtracting 1MA adding values 1CA transport cost (10)	**L3**
1.2	January: $\frac{46\,487}{142\,702} \times 100\%$ = 32,58% ✓MA ✓CA February: $\frac{46\,663}{150\,349} \times 100\%$ = 31,04% ✓CA March: $\frac{59\,046}{162\,215} \times 100\%$ = 36,4% ✓CA The highest average percentage mark-up was in March ✓O	1MA Using correct values and calculating the mark up 1CA for calculating January mark-up % 1CA for calculating February mark-up % 1CA for calculating March mark-up % 1O Choice (5)	L2

Ques	Solution	Explanation	Level
1.3	Total net income for the first quarter = R19 885 + R18 936 + R24 808 = R63 629 ✓MA Average net income per month = R63 629 ÷ 3 = R21 209,67 ✓CA Projected amount = R21 209,67 × 12 = R254 516 ✓CA The projected amount is valid ✓O **OR** Total net income for the first quater = R19 885 + R18 936 + R24 808 = R63 629 ✓MA Projected amount = R63 629 × 4 ✓CA = R254 516 ✓CA The projected amount is valid	1MA total net income 1CA ave. monthly income 1CA calculating estimated net income per year. 1O validity **OR** 1MA calculating total net income 1CA multiplying with 4 1CA estimated net income 1O validity (4)	L4
1.4.1	Handbags ✓✓A	2A correct product (2)	L2
1.4.2	Width ≈ 5 cm ✓A ∴ Actual width = 5 × 100 cm ✓M = 500 cm or 5 m✓CA	1 A measurement 1M using scale 1CA actual width [Accept measurements from 4,8 cm to 5,2 cm] (3)	L3

Ques	Solution	Explanation	Level
1.5	Volume of a cylinder $= \pi \times (\text{radius})^2 \times \text{height}$ $100 \text{ ml} = 3{,}142 \times (\text{radius})^2 \times 4 \text{ cm}$ ✓SF ✓C $100 \text{ cm}^3 = 12{,}568\,(\text{radius})^2$ $\frac{100}{12{,}568} = \frac{12{,}568(\text{radius})^2}{12{,}568}$ ✓MA $7{,}956715468 = (\text{radius})^2$ $\sqrt{7{,}956715468} = \sqrt{(\text{radius})^2}$ $2{,}82076505 = \text{radius}$ ✓CA Diameter $= 2{,}82076505 \times 2 \text{ cm}$ $= 5{,}6415301 \text{ cm}$ ✓CA	1SF substitution 1C converting to cm^3 1MA simplifying 1CA radius 1CA diameter (5)	L3

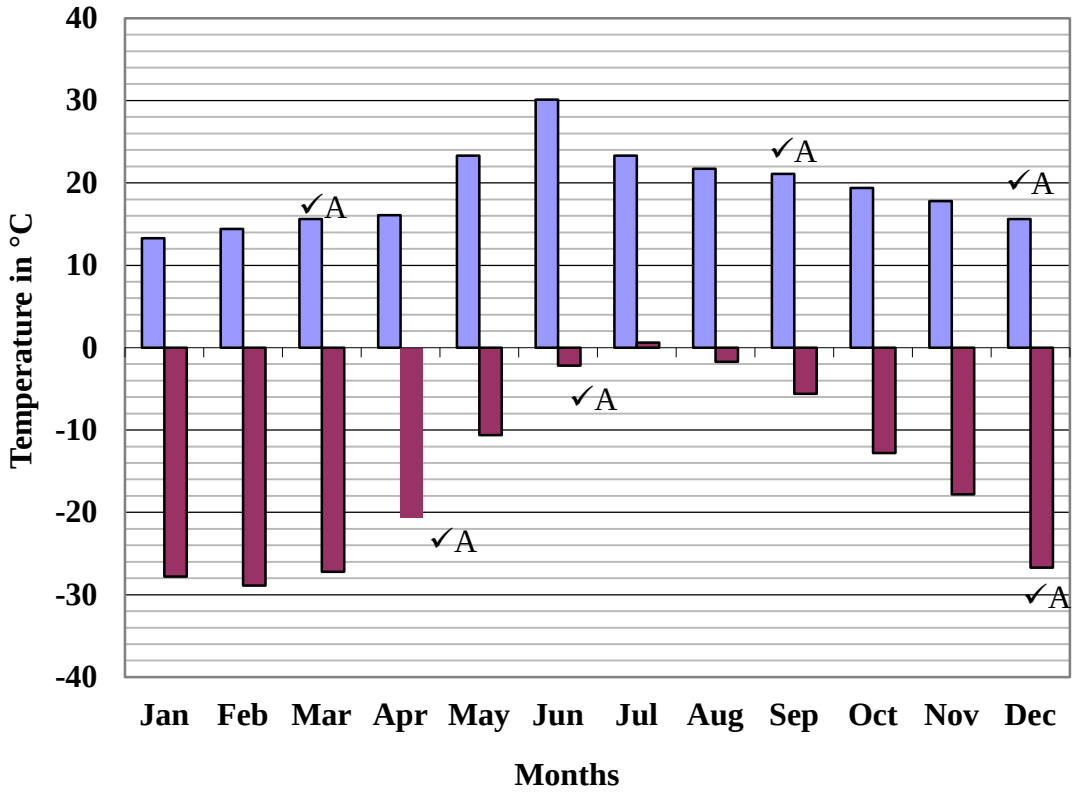
Ques	Solution/Explanation	Level
1.6.1	 **Key** .....Toyota Yaris ------Ford Figo 1A the start of graph with open circle 1A the straight line from 0 to 500 1A for straight line from 500 to 2 000 1A for any correct point plotted between 500 and 2 000 (4)	L3

Ques	Solution	Explanation	Level
1.6.2	Approximately 540 km ✓✓ RG	2RG values between 520 km and 575 km (2)	L3
1.6.3	Toyota Yaris: Approx R2 390 ✓ RG ✓ O The Toyota Yaris will be the cheapest when travelling a distance of 1 850 km	1RG reading correct value 1O for choice (2)	L3

QUESTION 2 [31 MARKS]			
Ques	**Solution**	**Explanation**	**Level**
2.1.1	South West ✓ ✓ A	2A direction (2)	L2
2.1.2	Aqua scene ✓ A Darwin Entertainment Centre ✓ A	1A for each of the places of interest (2)	L2
2.1.3	✓ A Turn left into McMinn Street continue till reaching Stuart HWY. ✓ A Turn right onto Stuart HWY continue till you reach Bagot Rd. ✓ A ✓A Turn left onto Bagot Rd continue north and at Rapid Creek, turn left onto Trower Rd. Proceed on this road till you see the shopping centre on your left hand side.	1A left into McMinn Street 1A right Stuart 1A left Bagot 1A left Trower (4)	L2
2.1.4	Distance = average speed × time 12,4 km = average speed × 18 min ✓ SF 12,4 km = average speed × $\frac{18}{60}$ hours ✓ C Average Speed = $\frac{12{,}4\,\text{km}}{\frac{18}{60}\,\text{hour}}$ = 41,3 km/h ✓ CA ✓ O The travel time is due to slow traffic flow since an average speed of 60 km/h is normal in built up areas.	1SF substitution 1C conversion 1CA average speed 1O justification (4)	L4

Ques	Solution	Explanation	Level
2.2.1	ATM cash withdrawal fee for R500 = R 3,50 + 1,1% of value = R 3,50 + 1,1% × R500 ✓ SF = R 9,00 ✓ CA Four ATM cash withdrawals of R500 each = 4 × R9,00 = R36,00 ✓ CA Five debit orders = 5 × R12,00 = R60,00 ✓ CA Seven debit card purchases = 7 × R0,00 = R 0,00 ✓ A Cash Deposit fee (in branch) = R 11,00 + 1,35% of value = R 11,00 + 1,35% × R4 500 ✓ SF = R 71,75 ✓ CA Monthly fee = R36,00 + R60,00 + R0,00 + R71,75 ✓MA = R167,75 ✓ CA	1 SF Using correct fee and substitution 1CA Amount 1CA Calculating fee 1CA Calculating fee 1A no fee for debit 1SF correct formula 1CA amount 1MA adding values 1 CA monthly fee (9)	L4
2.2.2	Number of times more = $\frac{R167,75}{R53}$ ✓ MA = 3,165 ✓ CA ≈3 More than three times the minimum monthly fee ✓ O Elizabeth was correct. **OR** ✓ M 3 × R53 = R159 ✓ CA R167,75 is more than three times the minimum monthly fee Elizabeth was correct ✓ O	1MA calculating the number of times 1CA the rounded value 1O verification **OR** 1M multiplying 1CA the amount 1O verification (3)	L4
2.2.3	Fixed monthly option = R 104,00 Four ATM cash withdrawals of R500,00 each = R0,00 ✓ A Five debit orders = R0,00 Seven debit card purchases = R0,00 ✓ A One cash deposit of R 4 500,00 each = R0,00 Monthly fee = R104,00 ✓ A	2ACost of transactions 1A for fee of R104,00 (3)	L2
2.2.4	She can use her bank/debit card to pay for these goods and services. ✓✓ O Once-off withdrawal equivalent to four times the weekly amount spend to deduct each month. ✓✓ O	2 O reason 2 O reason (4)	L4

QUESTION 3 [25 MARKS]			
Ques	**Solution**	**Explanation**	**Level**
3.1.1	2 655 km : 1 650 miles **OR** 2 655 km : 1 650 miles $\frac{2655\text{km}}{2655} : \frac{1650\text{miles}}{2655}$ ✓ MA $\frac{2655\text{km}}{1650} : \frac{1650\text{miles}}{1650}$ ✓ MA 1 km = 0,6214689266 miles 1,6090909 km = 1 mile 1 km ≈ 0,6215miles ✓ S 1,6 km ≈ 1mile ✓ S	1MA dividing 1S simplification (2)	L3
3.1.2	Greenland is an irregular shape, and it is not a rectangle. ✓✓O	2O explanation (2)	L4
3.1.3	✓ A ✓A April 6 days + May 31 days + June 30 days + July 31 days + ✓A August 18 days = 116 days ✓C A The midnight sun lasts 116 days	1A 6 days in April 1A 18 days in August 1A rest of the months 1CA total days (4)	L3
3.2.1	**Population density = $\frac{\text{Total number of persons living on the island}}{\text{ice-free area (in km}^2\text{)}}$** $= \frac{56\ 370\ \text{persons}}{2\ 166\ 086 \times 19\%\ \text{km}^2}$ ✓A ✓SF $= \frac{56370\,\text{persons}}{411\ 556{,}34\ \text{km}^2}$ ✓CA = 0,1369678815 persons/km² ≈ 0,1 persons/ km² ✓CA	1SF substituting 1A 19 % 1CA ice-free area 1CA population density (4)	L3
3.2.2	Number of indigenous persons living in Nuuk in 2003 ✓A = 75% × 9 000 ✓RG = 6 750 ✓CA	1A 75 % 1RG number of inhabitants [accept values from 8 000 but less that 10 000] 1CA number of indigenous persons (3)	L3

Ques	Solution	Explanation	Level
3.2.3	4 ✓A ✓A	2A number of towns (2)	L2
3.3.1	Range = Highest value – Lowest value = (0,6 °C) – (–28,9 °C) ✓MA = 29,5 °C ✓CA	1MA concept of range 1CA range (2)	L2
3.3.2	**Monthly maximum and minimum temperature data for Ivituut**  1A × 6 for each bar plotted correctly (6)		L3

Question 4 (27 marks)			
Ques	**Solution**	**Explanation**	**Level**
4.1.1	$P = \frac{342\,171}{1300\,771}$ ✓ A ✓ A $\approx$ 0,263 ✓ CA	1A total light vehicle learner licenses 1A total number of learner licences 1CA probability in decimal form (3)	L3
4.1.2	Gauteng: 102 191 : 293 094 ✓ A $1 : \frac{293094}{102191}$ ✓ MA $\therefore$ 1 : 2,868 ✓ CA Limpopo: 8 234 : 98 151 $1 : \frac{98\,151}{8\,234}$ $\therefore$ 1 : 11,925 ✓ CA ✓ O The ratio for Limpopo is higher than for Gauteng	1A working with the correct values 1MA dividing to find unit ratio 1CA simplification 1CA simplification 1O comparison (5)	L3
4.1.3	Gauteng: $\frac{415818}{1300771} \times 100\%$ $\approx$ 32% ✓CA Limpopo: $\frac{107702}{1300771} \times 100\%$ $\approx$8,3% ✓ CA ✓✓ J The population of Limpopo is less than that of Gauteng. **OR** The main mode of transport in Gauteng is cars. **OR** Any other valid reason	1CA percentage 1CA percentage 2J reason (4)	L2(2) L4(2)
4.1.4	She needs to compare the number of learners who passed the Light Motor vehicle licence to the total number of learners who wrote the test for light motor vehicle licence. ✓✓✓J **OR** Table 4 data cannot be used to calculate the probability of passing **OR** Incorrect data/wrong data was used	3J reason (3)	L4

Ques	Solution	Explanation	Level
4.2.1	Drivers have very little driving experience. ✓✓ O	2O explanation (2)	L4
4.2.2 (a)	Amount to be paid by Keitumetse - compulsory excess payment of R2 000. ✓ A - payment of R 1 000 for being under 25 years old. ✓ A - payment of R2 000 for drivers' licence of less than 2 years. Total excess to be paid = R5 000 ✓ CA Percentage of claim amount = $\frac{5000}{13400,50} \times 100\%$ ✓M $\approx$ 37,31 % ✓ CA	1A for R2 000 1A for other 2 amounts 1CA the total amount 1M calculating percentage 1CA percentage of his claim (5)	L3
4.2.2 (b)	Amount to be paid by Keitumetse's father - Payment of R2 000 for the compulsory excess. ✓ RT Insurance compensation = value of damage – excess value = R13 400,50 – R2 000 = R11 400,50 ✓ MA $\frac{11400,50}{13400,50} \times 100\% = 85\%$ ✓ M ✓ CA ✓O He is correct; it is more than 80%.	1RT the amount 1MA the total payable 1M percentage calculating 1CA percentage 1O verification (5)	L4

QUESTION 5 [30 MARKS]			
Ques	**Solution**	**Explanation**	**Level**
5.1.1	Median = $\frac{P+55}{2} = 55$ ✓ M ∴ P = 55 ✓ A Mean = $\frac{\text{sum of the marks}}{\text{total number of students}}$ 49,25 = $\frac{1124+Q}{24}$ ✓ CA 1182 = 1124 + Q ✓ S ∴ Q = 58 ✓ CA	1M concept of median 1A value of P 1CA the sum 1124 1S the total 1182 1CA value of Q (5)	L3
5.1.2	$P_{(\text{less than } 80\%)} = \frac{21}{24}$ ✓ CA $= \frac{7}{8}$ **OR** 0,875 **OR** 87,5% ✓ S	1CA probability 1S simplification (2)	L2
5.1.3	Group A: Quartile 1 = 28 ✓ RG **OR** $\frac{23+33}{2} = 28$ Quartile 3 = 75 ✓ RG Inter quartile range = 75 – 28 = 47 ✓ CA Group B: Inter quartile range = 70 – 30 = 40 ✓ A ∴ Group B has a lower inter quartile range ✓ O ✓ A ∴ Group B performed better because they have a higher median and a smaller inter quartile range. ✓ O	1RG estimate the value Q1 1RG estimate the value Q3 1CA the IQR 1A group B IQR 1O comparing IQRs 1A comparing the median percentages 1O explaining group B did better (7)	L3(5) L4(2)

Ques	Solution	Explanation	Level
5.2.1(a)	✓ A Both the bath room door and Bedroom 2 door must open to the inside and not the outside as on the plan. ✓ O ✓ O If the doors open to the outside the open doors covers the entrance to Bedroom 1 and the master bedroom	1A identifying the doors 1O explanation 1O explanation (3)	L4
5.2.1(b)	✓ O The toilet pans are positioned against the interior walls which make the sewer pipes to run in the walls or under the foundation, which is against building regulation. ✓O The toilet pans must be positioned next to exterior walls for the sewer pipes to go through the wall. ✓ O The master bedroom toilet pan must be moved to the exterior wall next to the window.	1O identifying the position of the toilet pans 2O alternative position (3)	L4
5.2.2	✓✓ O Family Room and Kitchen	2O identifying the rooms (2)	L4
5.2.3	✓ A Actual length = 33 mm × 125 = 4 125 mm = 412,5 cm ✓ CA Actual breadth = 28 mm × 125 = 3500 mm = 350 cm ✓ CA Floor area of the room in cm^2 = length × breadth = 412,5 × 350 = 144 375 ✓ CA ∴ minimum area of the window in cm^2 = 144 375 × 11,5% = 16 603,125 ✓ CA Area of the window in cm^2 = width × height 16 603,125 = 220 × height ∴ height in cm = $\frac{16\,603{,}125}{220}$ ✓ M = 75,46875 ≈ 75 ✓ CA	1A using scale 1CA length 1CA breadth 1C converting 1CA area of room 1CA area of the window 1M finding the height 1CA rounding off (8)	L4