basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

MATHEMATICAL LITERACY P1

NOVEMBER 2014

MEMORANDUM

MARKS: 150

SYMBOL	EXPLANATION
M	Method
MA	Method with accuracy
CA	Consistent accuracy
A	Accuracy
C	Conversion
S	Simplification
RT/RG/RD	Reading from table/Reading from graph/Reading from diagram
SF	Substitution in a formula
RO	Rounding off
NPR	No penalty for rounding
J	Justification /Reason
NO PENALTY IF UNITS OMITTED UNLESS STATED OTHERWISE	

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KEY TO TOPIC SYMBOLS:
F = Finance; M = Measurement; MP = Maps, Plans and other representations;
DH = Data Handling; P = Probability

QUESTION 1 [38]			
Ques	**Solution**	**Explanation**	**Topic**
1.1.1	17 % ✓✓RD **OR** 0,17 ✓✓RD **OR** $\frac{17}{100}$ ✓✓RD	2 RD reading from diagrams Max 1 mark for 17 (2)	**F** L1
1.1.2 (a)	R2 443,49 ÷ 24✓M/A = R101,81✓CA **Accept correct answer only**	1M/A division by 24 1CA only if using R2 100 **NPR** (2)	**F** L1
1.1.2 (b)	Original selling price = R1 989 + R210 ✓M/A = R2 199 ✓A **Accept correct answer only**	1M/A adding 1A simplify (2)	**F** L1
1.1.2 (c)	15% × R2 100 **OR** $\frac{15}{100}$ × R2 100 ✓M/A **OR** 0,15 × R2 100 = R315 ✓CA **Accept correct answer only**	1M/A multiplying 1CA simplify (2)	**F** L1

Ques	Solution	Explanation	Topic
1.1.2 (d)	✓RD Total payment = R88 × 30 months = R2 640 ✓M/A ✓M Total cost = R199 + R2640 = R2 839 ✓CA **Accept correct answer only**	1RD reading values from advert 1M/A multiplication 1M addition of R199 1CA simplify Accept R2 839,25 if the formula for Simple Interest is used (4)	**F** L1(2) L2(2)
1.2.1	Clover **milk** ✓✓A	2A correct item Full marks if answer is given as l l (liter) OR milk only (2)	**F** L2
1.2.2	Cost of 1 tin of condensed milk = R16,95 – R1,00 = R15,95 ✓M/A Number of tins of condensed milk ✓M = R159,50 ÷ R15,95 = 10 ✓CA **OR** Cost of 1 tin of condensed milk = R159,50 ÷ R16,95 ✓M = 9,4 Number of tins of condensed milk ≈10✓✓RO **Accept correct answer only**	1M/A subtracting 1M division 1CA no. of tins **OR** 1M division by R16,95 2 RO to 10 Max 1 mark for 9,4 with calculations Max 2 marks for 9 with calculations (3)	**F** L1

Ques	Solution	Explanation	Topic
1.2.3	✓M ✓A **A** = R289,52 + R29,07 = R318,59 **OR** ✓M **A** = 14,99 + 21,95 + R159,50 + R9,95 + R19,95 + R14,99 + R14,99 + R46,99 + R8,29 + R6,99 = R318,59 ✓A **Accept correct answer only**	1M adding 1A simplify 1M adding 1A simplify 1 mark if one value is omitted (2)	**F** L1
1.2.4	12/10/2013 till 12/12/2013 ✓RD = 2 months ✓A **OR** 61 days **OR** 62 days **OR** 60 days **Accept correct answer only**	1RD Reading from slip 1A simplify Accept 2 or 3 days Max 1 mark for until (or up to) 12/12/2013 (2)	**F** L1
1.2.5	135 g ÷ 1000 = 0,135kg ✓C R19,95 ÷ 0,135 kg ✓M = R147,78 ✓CA **OR** R19,95 ÷ 135 g = R0,1477… per gram ✓M ✓C R0,14777… × 1 000 g = R147,78 **OR** ✓C 135 g : 1 000 g R19,95 : *x* ✓M ✓CA *x* = R19,95 × 1 000 ÷ 135 = R147,78 **Accept correct answer only**	1C Convert to kg 1M Dividing 1CA cost per kg **OR** 1M Dividing 1C convert to kg 1CA cost per kg **OR** 1C Convert to g 1M multiply & divide 1CA cost per kg (3)	**F** L1

Ques	Solution	Explanation	Topic
1.2.6	✓M R14,99 + R9,95 + R19,95 + R14,99 + R14,99 + R6,99 = R81,86 ✓A **OR** ✓M R318,59 – (R21,95 + R8,29 + R46,99 + R159,50) = R318,59 – R236,73 = R81,86 ✓A **Accept correct answer only**	1M adding values 1A simplify **OR** 1M adding values 1A simplify If one value is omitted only 1 mark (2)	**F** L1
1.2.7 (a)	**B** = R318,59 round down ✓CA =R318,55✓CA **OR** **B** = R318,59 round up ✓CA =R318,60 ✓CA **Accept correct answer only**	1CA identify correct value for rounding 1CA rounding down from Q 1.2.3 **OR** 1CA identify correct value for rounding 1CA rounding up from Q 1.2.3 (2)	**F** L1
1.2.7 (b)	**C** = R200 + (2 × R100) = R400✓M/A ✓M **D** = R400 – R318,55 = R81,45✓CA ✓M **OR** **D =** R400 – R318,60 = R81,40 ✓CA **Accept correct answer only**	1M/A adding money 1M Subtracting 1CA from Q 1.2.7(a) **OR** 1M Subtracting 1CA from Q 1.2.7(a) (3)	**F** L1

Ques	Solution	Explanation	Topic
1.2.8 (a)	✓M Profit per packet = R14,99 – R12,00 = R2,99 ✓A ✓A Profit per dozen = 12 × R2,99 = R35,88 ✓CA **OR** Cost price per dozen = 12 × R12,00 = R144 ✓A Selling price per dozen = 12 × R14,99 = R179,88 ✓A Profit per dozen = R179,88 – R144 ✓M = R35,88 ✓CA	1M calculate profit per packet 1A profit 1A multiply by 12 1CA profit of 1 dozen **OR** 1A cost price per dozen 1A selling price per dozen 1M calculate profit per dozen 1CA profit (4)	**F** L1
1.2.8 (b)	Percentage mark up $= \frac{\text{selling price} - \text{cost price}}{\text{cost price}} \times 100\%$ $= \frac{R14,99 - R12,00}{R12,00} \times 100\ \%$ ✓SF = 24,916 % ✓A ≈ 25 % ✓RO **OR** Profit = R14,99 – R12,00 = R2,99 ✓M Percentage profit = $\frac{R2,99}{R12,00} \times 100\ \%$ = 24,916 % ✓M ≈ 25 % ✓RO **Accept correct answer only**	1 SF substitute in formula 1A simplify 1RO rounding to whole percentage **OR** 1M profit 1M % profit simplify 1RO rounding to whole percentage (3)	**F** L2
			[38]

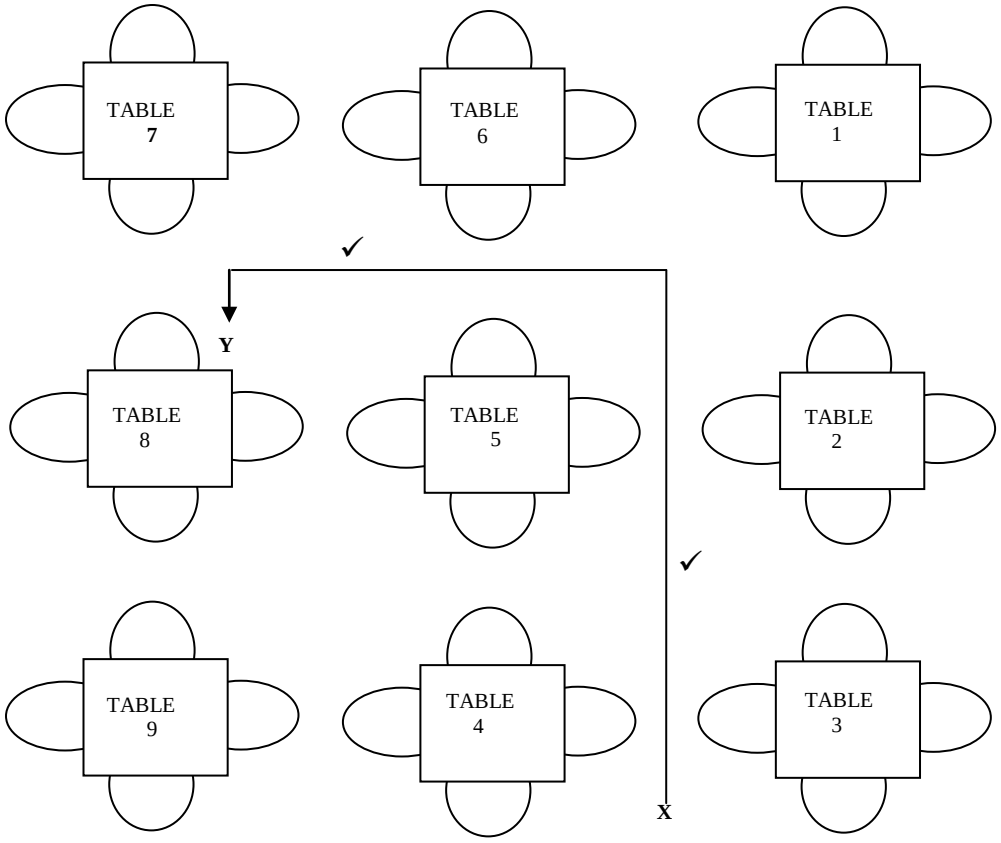
QUESTION 2 [26]			
Ques	**Solution**	**Explanation**	**Topic**
2.1.1	7 ✓✓A	2A number of fields Accept 2 as answer (2)	**M** L1
2.1.2 (a)	✓M Length of fencing = 33 m + 33 m = 66 m ✓A Total length to buy = 70 m ✓RO **OR** 14 rolls **OR** ✓M Length of fencing = 33 m × 2 = 66 m ✓A Total length to buy = 70 m ✓RO **OR** 14 rolls **Accept correct answer only**	1M addition 1A length 1RO rounding to nearest 5 **OR** 1M multiplying by 2 1A length 1RO rounding to nearest 5 Max 2 marks for 165m or 33 rolls (3)	**M** L1
2.1.2 (b)	✓M ✓M ✓CA Number of poles = 66 m ÷ 1,5 m = 44 poles **OR** ✓M ✓M ✓CA Number of poles = (33 ÷ 1,5) × 2 = 44 poles	1M using 66 m 1M dividing by 1,5 1CA no. of poles as whole number from Q 2.1.2 (a) **OR** 1M divide by 1,5 1M multiply by 2 1CA no. of poles as whole number from Q 2.1.2 (a) (3)	**M** L1
2.1.3	New length = 125 m + 33 m = 158 m ✓A Length of old field : Length of extended field 125 : 158 ✓M **Accept correct answer only**	1A length 1M writing as a ratio using at least 125 (2)	**M** L2
Ques	**Solution**	**Explanation**	**Topic**

2.1.4	Area = 158 m × 95 m ✓SF ✓ CA = 15 010 m^2 ✓A	1SF substitution 1CA area 1A unit of m^2 (3)	**M** L1(1) L2(2)
2.2.1	✓RT Diameter = 2 200 mm ÷ 1 000 = 2,2 m✓A **Accept correct answer only**	1RT 2200 mm 1A diameter in m (2)	M L1
2.2.2	Radius = 1,1 m ✓CA Volume = 3,142 × $(1,1)^2$ × 3 ✓SF = 11,40546 m^3 ✓CA = 11,40546 m^3 × 1 000 ℓ/m^3 ✓C = 11 405,46 litres ✓CA **OR** Radius = 1,1 m ✓CA ✓C Volume = 3,142 × $(1,1)^2$ × 3000 ✓SF = 11 405,46 litres ✓✓CA	1CA radius from Q 2.2.1 1SF substitution 1CA volume 1C multiply by 1 000 1CA litres **OR** 1CA radius from 2.2.1 1C multiply by 1 000 1SF substitution 2CA litres Max 3 marks if calculation is simplified (with out squaring) (5)	M L2

Ques	Solution	Explanation	Topic
2.3.1	Time = 11:56 ✓RD ✓M Time it switched on = 11h56 – 2h45 = 09h11 Time it switched on = 09:11 ✓A **OR** 9.11 am **OR** 11 minutes past nine in the morning. **OR** Time = 11:56 ✓RD Subtract 2 hours = 9h56 Subtract 45 minutes = 9h11 ✓M Time it switched on = 09:11 ✓A **OR** 9.11 am **OR** 11 minutes past nine in the morning	1RD reading time 1M subtracting time 1A simplify 09h11 only 2 marks **OR** 1RD reading time 1M subtracting time 1A simplify Full marks if time is read as 11:55 with answer 09:10 or 09.10 a.m. or 10 minutes past nine in the morning (3)	M L1(2) L2(1)
2.3.2	Temperature in $°F = (1{,}8 \times 25°) + 32°$ ✓SF ✓A = 45° + 32° = 77° ✓CA **Accept correct answer only**	1SF substitute 1A simplify 1CA degrees Fahrenheit (3)	M L2
			[26]

QUESTION 3 [25]			
Ques	**Solution**	**Explanation**	**Topic**
3.1.1	✓A ✓A The actual size of the shirt is 18 times bigger in reality than shown on the diagram **OR** ✓A ✓A ***Every unit in the diagram represents 18 units in reality ✓A **OR** ✓A ***Every mm/cm on diagram = 18 mm/cm in reality ✓A **OR** The diagram is $\frac{1}{18}$ of the actual size of shirt. ✓A ✓A **OR** ✓A The diagram is 18 times smaller than the actual shirt.	1A actual size 1A 18 times bigger **OR** 1A unit on diagram 1A 18 units in reality 1A mm/cm diagram 1A 18 mm/cm reality 1A $\mathbf{\frac{1}{18}}$ 1A actual size of shirt 1A 18 times smaller 1A actual size of shirt ***** Both units must be the same (2)	**MP** L1
3.1.2	✓M 486 mm ÷ 18 = 27 mm ✓A **OR** 1 : 18 = **s** : 486 ✓M 18s = 486 s = $\frac{486}{18}$ mm = 27 mm ✓A **Accept correct answer only**	1M dividing by 18 1A scaled length 1M ratio 1A scaled length (2)	**MP** L2
3.1.3	10 buttons (as seen on diagram) ✓✓A **OR** 11 buttons for assuming the collar has a button ✓✓A	2A number of buttons 2A number of buttons (2)	**MP** L1

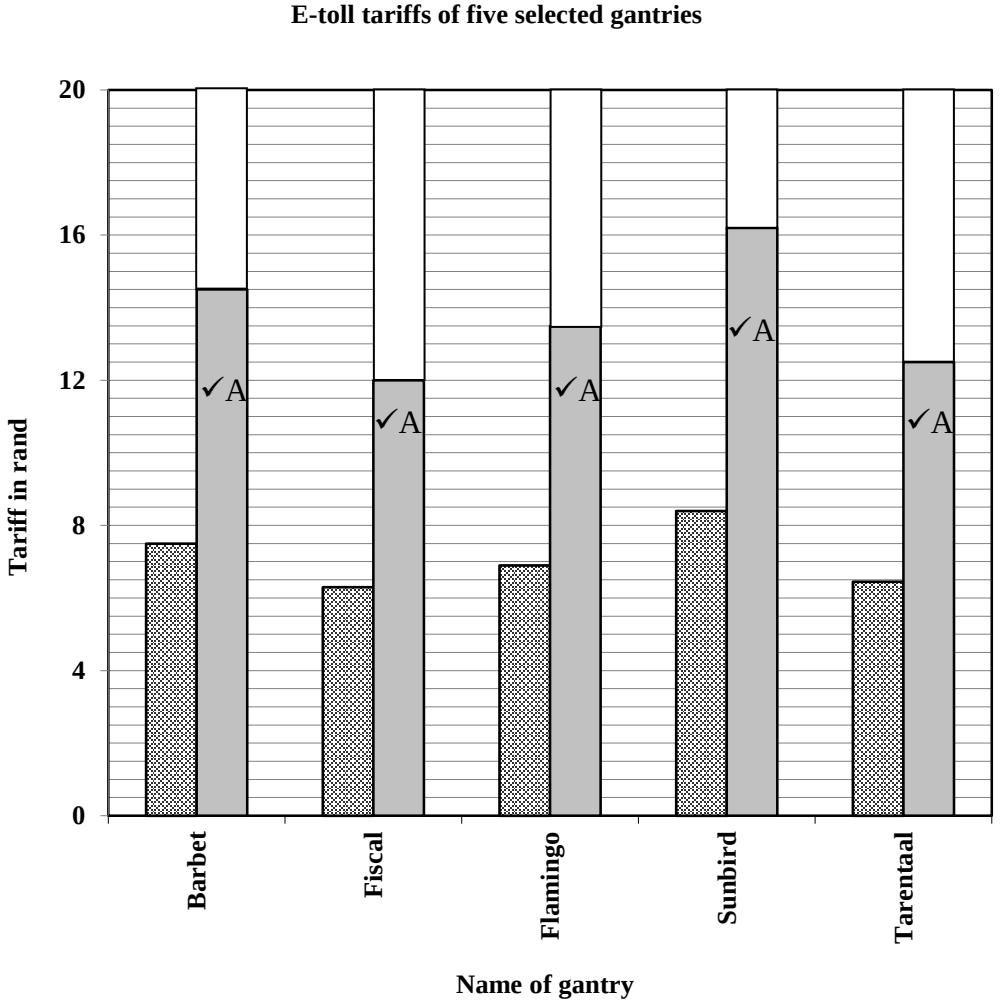
Ques	Solution	Explanation	Topic
3.1.4	Length of strip = 21,5 mm ✓A Actual length = 21,5 mm × 18✓M = 387 mm ✓CA **OR** **Alternative possible measurements:** Accept: 378 mm to 396 mm	1A length in mm 21mm OR 22mm 1M multiplication by 18 1CA simplify (3)	**MP** L1(1) L2(2)
3.1.5	Right hand side ✓✓A	2A interpret diagram (2)	**MP** L1
3.2.1	✓M/A **K** = 60 cm + 90 cm + 60 cm = 210 cm ✓A **Accept correct answer only**	1M/A adding 1A simplify (2)	**MP** L1
3.2.2	✓M/A Maximum number of persons = 9 × 4 = 36 ✓A **Accept correct answer only**	1M/A multiplying 1A no of persons (2)	**MP** L1
3.2.3	✓RD ✓CA ✓M T = 900 cm – 150 cm – (3 × 210 cm) – (2 × 50 cm) = 20 cm ✓CA **OR** ✓CA ✓M ✓M T = (900 – 210 – 50 – 210 –50 –210 – 150) cm = 20 cm ✓CA **OR** ✓M ✓M ✓M T = 900 – (60 × 6) – (90 × 3) – (50 × 2) – 150 = 900 – 880 = 20 cm ✓CA **Accept correct answer only**	1RD length of 900 cm 1 CA tables × 3 1M subtracting values 1CA simplify **OR** 1M length of 210 cm 1M subtracting 1M correct values 1CA length **OR** 1M length of 6 chairs 1M length of 3 tables 1M spaces between tables 1CA simplify (4)	**MP** L2

Ques	Solution	Explanation	Topic
3.2.4	 1A line drawn northern direction (up), passing between 2 pairs of tables 1A line drawn western direction (left) to point Y Does not have to be horizontal or vertical straight lines. Accept any indication of the route. (2)		**MP** L2
3.2.5	South West ✓✓A **Accept exact direction only**	2A compass direction 1 mark for North East Accept SSW or WSW or NNE or ENE (2)	**MP** L1

Ques	Solution	Explanation	Topic
3.2.6	Two tables joined requires 6 chairs Number of tables = $24 \div 6$ = **4 pairs** **OR** 8 ✓M ✓A **OR** 2 Tables requires 6 chairs Ratio of tables as to chairs = 2 : 6 = 1 : 3 ✓M Number of tables = $24 \div 3 = 8$ ✓A OR $24 \times \frac{2}{6}$ **Accept correct answer only**	1M method 1A number of tables **OR** 1M method (ratio) 1A number of tables (2)	**MP** L1
			[25]

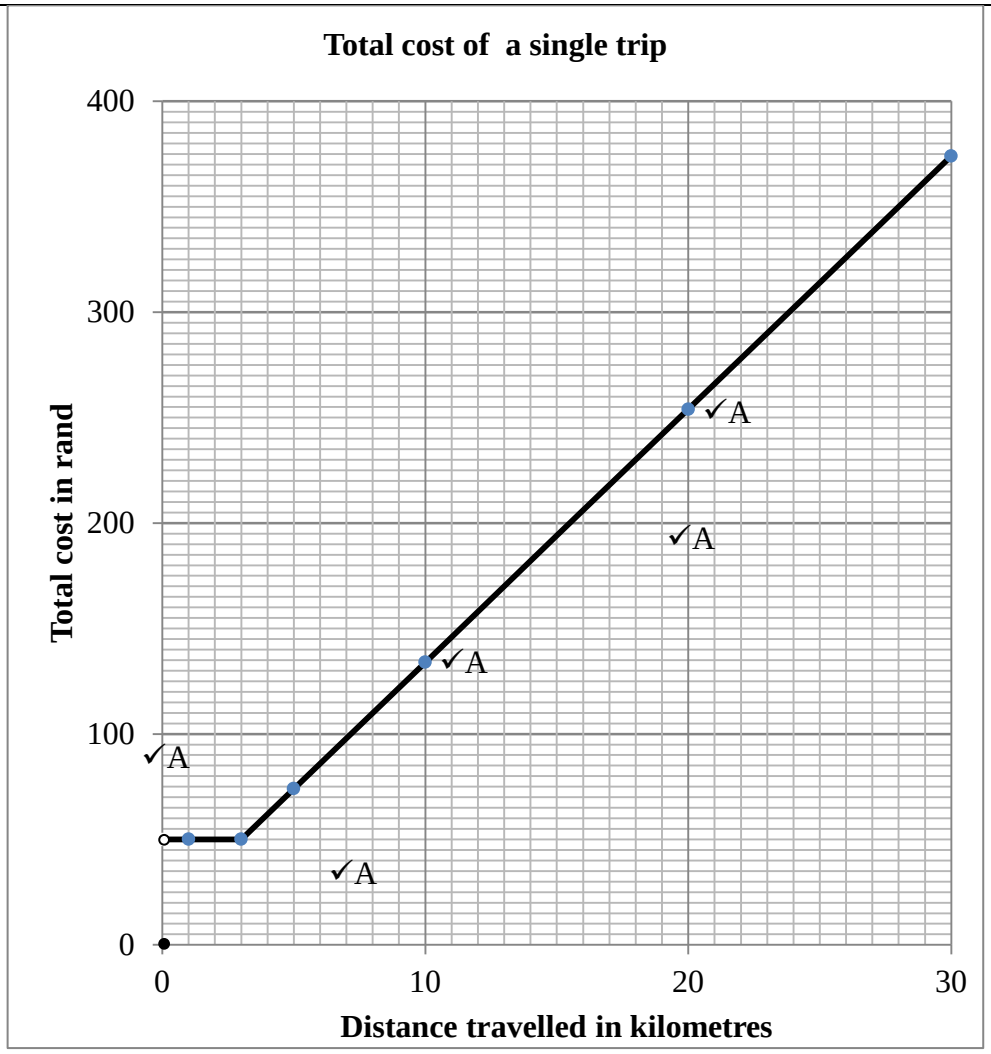
QUESTION 4 [37]			
Ques	**Solution**	**Explanation**	**Topic**
4.1.1	R13,78 ✓✓RD	2 RD Class C cost (2)	**DH** L1
4.1.2	✓A ✓A Ihobhe and Sunbird	1A Ihobhe 1A Sunbird Only 1 mark if two incorrect names added. No mark if more than two names added (2)	**DH** L1
4.1.3 (a)	Mean = ✓RT $\frac{7,50+7,50+7,28+7,28+6,90+6,90+8,40+8,40+6,45}{17}$ $+\frac{6,45+8,03+8,03+7,13+7,13+6,30+6,30+1,50}{17}$ ✓A $=\frac{117,48}{17}$ ✓M = R6,91 ✓CA **Accept correct answer only**	1RT correct values 1A dividing by 17 1M sum of values 1CA mean (4)	**DH** L2
4.1.3 (b)	Ordering: ✓✓M/A 1,50; 6,30; 6,30; 6,45; 6,45; 6,90; 6,90; 7,13; 7,13; 7,28; 7,28; 7,50; 7,50; 8,03; 8,03; 8,40; 8,40 Median = R7,13 ✓CA **Accept correct answer only**	2M/A ordering of values 1CA median (3)	**DH** L2

Ques	Solution	Explanation	Topic
4.1.3 (c)	Median is the better representation ✓A ✓✓J The mean is affected by the R1,50 which is an outlier. **OR** ✓A Both the mean and the median are suitable representations because the difference between them (R0,22) is negligible ✓✓J	1A Identify the correct central tendency (with a possible reason) 2J Correct reason **OR** 1A both mean and median (with a possible reason) 2J Correct reason (3)	**DH** L3
4.1.4	✓RT Difference = R6,50 – R4,87 ✓M/A = R 1,63 ✓CA	1RT reading values from table 1M/A subtraction (one value correct) 1CA difference (3)	**DH** L1
4.1.5	✓M ✓CA 3,21 : 8,03 = 321 : 803 **OR** 1 : 2,5	1M ratio 1CA ratio simplified (2)	**DH** L1
4.1.6	✓M/A Amount saved = R5,63 – R2,91 = R2,72 ✓CA	1M/A subtracting correct values of Pikoko 1CA value (2)	**DH** L1

Ques	Solution	Explanation	Topic
4.1.7	 5A correctly drawing the 5 (five) bars/plotting the points correctly. NB: Sunbird may NOT be drawn on a gridline. MUST be between the 16 and 16,50 line. Max 3 marks if values of other columns are used on condition that all 5 bars are used from the same column of values (5)		**DH** L2
4.2.1	External Loans ✓✓A **OR E** ✓✓A	2A reading data (2)	**DH** L1
4.2.2	✓M ✓CA 100% – (11%+2%+12%+3%+14%) = 58% **OR** 11%+2%+12%+3%+14% = 42% ✓M 100% – 42% = 58%✓CA **Accept correct answer only**	1M sum of all given % 1CA required % **OR** 1M sum of all given % 1CA required % 1 mark if 1 value is omitted (2)	**DH** L1

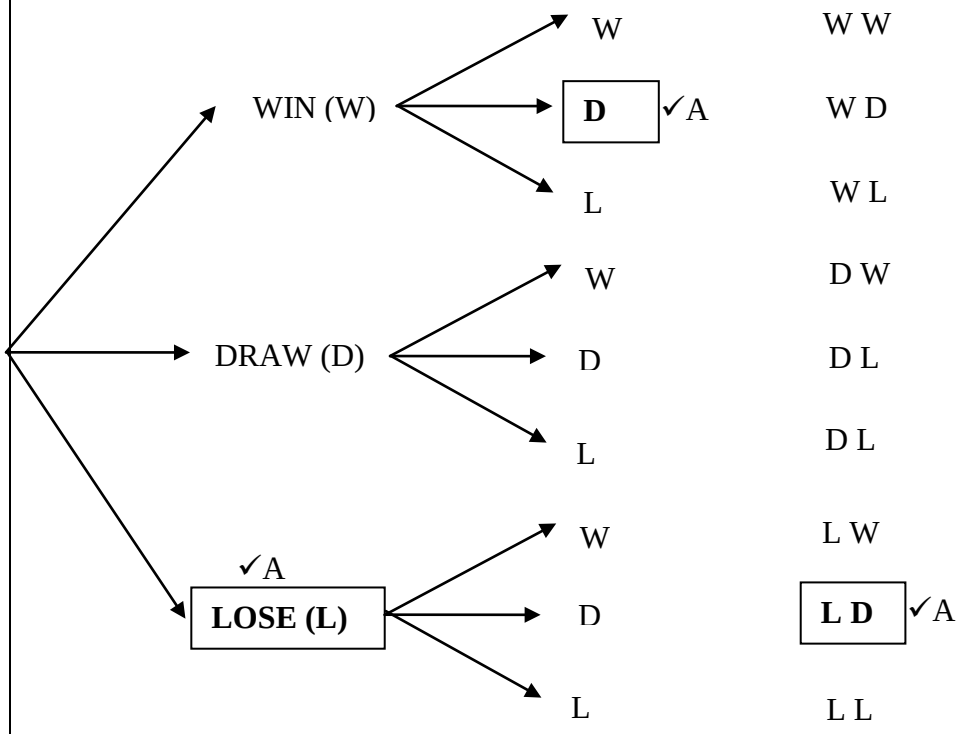
Ques	Solution	Explanation	Topic
4.2.3	✓RG Value of External Loans = $\frac{14}{100}$ × R587 646 376 ✓M = R82 270 492,64 ✓CA **OR** ✓RG 100% – 14% = 86% Value of External Loans ✓M = R587 646 376 – 86% of R587 646 376 = R82 270 492,64 ✓CA **Accept correct answer only**	1RG correct % 1M multiplying by R587 646 376 1CA loan amount **OR** 1RG correct % 1M subtracting 86 % of amount 1CA loan amount Penalty for incorrect rounding (3)	**DH** L1
4.2.4	Recreation Facilities ✓✓RG **OR L** ✓✓RG	2RG reading data (2)	**DH** L1
4.2.5	✓A Twenty eight **million**, four hundred and one thousand, seven hundred and thirty six rand. ✓A	1A millions 1A word format of number No penalty for units (2)	**DH** L1
			[37]

QUESTION 5 [24]			
Ques	**Solution**	**Explanation**	**Topic**
5.1.1	✓A ✓A ✓A Cost (R) = 50 + 12 × (number of kilometres – 3) ✓A ✓A **OR** ✓A Cost (R) = 50 + 12 × (number of kilometres) – 36 **OR** ✓✓A ✓A Cost (R) = 14 + 12 × number of kilometres **OR** ✓A ✓A ✓A Cost (R) = 50 + 12 × (k – 3) Where k = number of kilometres **OR** ✓A ✓A ✓A Cost (R) = 14 + 12 × k Where k = number of kilometres	1A R50 call-out fee 1A R12 × no km 1A no. km – 3 **OR** 1A R50 call-out fee 1A R12 × no km 1A no. km – 36 **OR** 2A R14 1A R12 × no. km **OR** 1A 50 call-out fee 1A 12 1A k – 3 (with description of k) **OR** 1A 50 – 36 1A 12 1A k (with description) Max 2 marks if variable is used and explained incorrectly (3)	**F** L2

5.1.2	 1A y-intercept at R50 and *must be an open circle* 1A **horizontal** line from 1 – 3 km; 2A any other 2 points correct 1A **inclined** line passing through correct plotted points (5)	**F** L2

Ques	Solution	Explanation	Topic
5.1.3	✓M/A Cost (without call out fee) = R1 214 – R50 = R 1 164 ✓M Kilometres charged = R1 164 ÷ 12 = 97 km ✓M Distance travelled = 97 + 3 = 100 km ✓A **OR** ✓M/A ✓M ✓M Distance = [(R1 214 – R50) ÷ R12] + 3 km = (R1 164 ÷ R12) + 3 km = 97 km + 3 km = 100 km✓A **OR** If number of kilometeres = ***n*** ✓SF 1 214 = 50 + [12 × (***n*** – 3)] 1 214 = 50 + 12***n*** – 36 12***n*** = 1 214 – 50 + 36 ✓S $n = \frac{1214-50+36}{12}$ ✓M = 100 ✓A **OR** Table used: km: 40 | 50 | 60 | 70 | 80 | 90 | 100 Cost: 494 | 614 | 734 | 854 | 974 | 1094 | 1214 Distance = 100 km ✓✓ ✓✓A **OR** ✓M Distance travelled = $\frac{R1214 - R14}{R12}$ km ✓M = 100 km ✓✓A **Accept correct answer only**	F L2 1M/A subtracting R50 1M dividing by 12 1M adding 3 km 1A distance **OR** 1M/A subtract R50 1M divide by R12 1M Adding 3 km 1A distance in km **OR** 1SF substitution 1S simplify 1M dividing by 12 1A distance in km **OR** 4A distance in km **OR** 1M value of 14 1M divide by 12 2A distance (4)	

Ques	Solution	Explanation	Topic
5.1.4	✓M/A ✓M Total taxi fare = R50 + (2 × R12) + R100 + (5 × R12) ✓S ✓S = R50 + R24 + R100 + R60 = R234,00 ✓CA **OR** ✓M Return distance from meeting = 5km × 2 = 10 km ✓A Reading from table : R134 for 10 km ✓RT Taxi fare = R134 + R100 ✓M = R234 ✓CA **OR** ✓M/A ✓M Total taxi fare = 50 + [12 × (10 – 3)] + 100 = 50 + (12 × 7) + 100 ✓M ✓S = 50 + 84 + 100 = R234 ✓CA **OR** Reading from graph ✓M 5km × 2 = 10 km ✓A 10 km cost R134 ✓RG Total taxi fare = R134 + R100 ✓M = R234 ✓CA	1M/A R50 call out fee 1M add R100 1S cost of R24 1S cost of R60 1CA cost of trip **OR** 1M multiply 1A 10 km 1RT R134 1M add R100 1CA cost of trip **OR** 1M/A R50 call out fee 1M subtract 3 km 1M add R100 1S 84 1CA cost of trip **OR** 1M multiply 1A 10 km 1RG R134 1M add R100 1CA cost of trip Max three marks if answer is R174 or R248 (5)	F L1 (2) L2 (3)

Ques	Solution	Explanation	Topic
5.2.1	 **NOTE: Accept answers if written in words.** (3)		**P** L3
5.2.2	C ✓✓A	2A statement (2)	**P** L1
5.2.3	$\frac{5}{9}$ ✓CA ✓CA **OR** ≈55,56%✓✓CA **OR** ≈0,56✓✓CA	1CA numerator 1CA denominator **OR** 2CA in % form **OR** 2CA in decimal form (2)	**P** L3
			[24]

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