basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

MATHEMATICAL LITERACY P2

FEBRUARY/MARCH 2018

MARKING GUIDELINES

MARKS: 150

SYMBOL	EXPLANATION
M	Method
MA	Method with accuracy
CA	Consistent accuracy
RCA	Rounding consistent accuracy
A	Accuracy
C	Conversion
S	Simplification
RT/RG	Reading from a table/graph/diagram
SF	Correct substitution in a formula
O	Opinion/Example/Definition/Explanation/Justification/Verification
P	Penalty, e.g. for no units, incorrect rounding off, etc.
R	Rounding off
NPR	No penalty rounding or omitting units
AO	Answer only, full marks

These marking guidelines consist of 19 pages.

QUESTION 1 [37 MARKS]			
Ques	**Solution**	**Explanation**	**T/L**
1.1.1	Number of days = 10 ✓A Number of hours per day = 10 ✓A Total hours = 10 × 10 =100 ✓CA	1A 10 days 1A 10 hours 1CA 100 hours **AO** (3)	M L2
1.1.2	VAT on teens ticket ✓RT = R50 × $\frac{14}{114}$ ✓MA = R6,14035 ≈ R6,14 ✓RCA **OR** ✓RT Price without VAT = $\frac{R50}{114\%}$ or $\frac{R50}{1,14}$ ✓MA ≈ R43,86 VAT = R50 – R43,86 = R6,14 ✓RCA	1RT using correct value 1MA for multiplying by $\frac{14}{114}$ 1RCA VAT **rounded** to nearest cent **OR** 1RT using correct value 1MA for dividing by 114% (1,14) 1RCA VAT **rounded** to nearest cent (3)	F L2
1.1.3	$P(_{Friday}) = \frac{2}{10}$ ✓A ✓CA $= \frac{1}{5}$ **or** 20% **or** 0,2 ✓CA	1A numerator 1CA denominator (Q 1.1.1) 1CA simplification **AO** (3)	P L2

Ques	Solution	Explanation	T/L
1.1.4	For 23 April: Total ticket cost = 2 × R150 ✓RT + R50 + R50 + R20 ✓M = R420 ✓CA For 20 April: Total ticket cost = 2 × R75 + R25 ✓A + R50 + R20 = R245 ✓CA Amount saved in rand = R420 – R245 = R175 ✓CA Percentage savings = $\frac{175}{420} \times 100\%$ ✓M = 41,66...% ✓CA Mrs Abrahams statement is **VALID** ✓O **OR** For 23 April: Total ticket cost = 2 × R150 ✓RT + R50 + R50 + R20 ✓M = R420 ✓CA For 20 April: Total ticket cost = 2 × R75 + R25 ✓A + R50 + R20 = R245 ✓CA Percentage of original = $\frac{245}{420} \times 100\%$ ✓M = 58,333…% ✓CA Percentage savings = 100% – 58,333…% = 41,66…% ✓CA Mrs Abrahams statement is **VALID** ✓O	1RT all correct values 1M adding values 1CA total cost 1A calculating adult and pensioner ticket price 1CA total cost 1CA amount saved 1M multiplying by 100% 1CA percentage 1O verification **OR** 1RT all correct values 1M adding values 1CA total cost 1A calculating adult and pensioner ticket price 1CA total cost 1M multiplying by 100% 1CA simplification 1CA percentage 1O verification **NPR** (9)	F L4
1.2.1	Eastern Cape or EC ✓✓RT	2RT correct province (2)	Data L2

Ques	Solution	Explanation	T/L
1.2.2	Supporting the needy /poor / sick / elderly / orphaned ✓✓O **OR** Supporting the physically / mentally challenged ✓✓O **OR** Any other suitable reason to explain why grants are given.	2O reason (2)	Data L4
1.2.3	✓O **No** or The data **cannot** be represented by a single pie chart Two categories / types / topics of data ✓✓O **OR** There are too many sectors (18) to be accurately/ easily represented using a single pie chart. ✓✓O **OR** ✓O **Not easy** to compare if it is a single pie chart. ✓✓O	1O opinion 2O reason (3)	Data L4
1.2.4	Total number of citizens receiving social grants = ✓M 2 756 621 + 2 405 846 + 3 921 846 + 463 599 + 1 205 069 + 987 337 + 1 429 411 + 1 506 147 + 2 474 055 ✓RT = 17 149 931 ✓CA Limpopo percentage ✓CA $= \frac{2\ 405\ 846}{17\ 149\ 931} \times 100\%$ ✓M ≈ 14 ,028313 % ✓CA **OR** also accept ✓M ✓RT Total number in Limpopo = 2 405 846 + 1 324 000 = 3 729 846 ✓CA Limpopo percentage $= \frac{2405846}{3729846} \times 100$ ✓CA ✓M = 64,50% ✓CA	1M adding 1RT for **all** correct values 1CA for number of people 1CA for dividing in correct order 1M calculating % 1CA simplification **OR** 1M adding 1RT for **all** correct values 1CA for number of people 1CA for dividing in correct order 1M calculating % 1CA simplification **NPR** (6)	Data L3

Ques	Solution	Explanation	Topic/L
1.2.5	Gauteng Employed citizens : social grants recipients 4 942 000 : 2 474 055 ✓RT ✓M 1 : 0,500 6 ✓CA Western Cape 2 266 000 : 1 506 147 ✓RT 1 : 0,664672 ✓CA Gauteng ✓O **OR** Gauteng ✓M Employed citizens : social grants recipients 4 942 000 : 2 474 055 ✓RT 1,99753 : 1 ✓CA Western Cape ✓RT 2 266 000 : 1 506 147 ✓CA 1,5045 : 1 Gauteng ✓O	1M writing as a ratio 1RT ratio with correct values 1CA Unit ratio 1RT ratio with correct values 1CA Simplification 1O conclusion **OR** 1M writing as ratio 1RT ratio with correct values 1CA Unit ratio 1RT ratio with correct values 1CA simplification 1O conclusion (6)	Data L4
		[37]	

QUESTION 2 [40 MARKS]			
Ques	**Solution**	**Explanation**	**T/L**
2.1.1	32 **OR** 31 ✓✓A	2A correct number of days (2)	M L2
2.1.2	Total credit ✓MA = – R37,81 + (–R200,00) + (–R0,01) = – R237,82 ✓CA Total debit ✓MA = R200,00 + R4,00 + R31 716,69 + R10 770,00 = R42 690,69 ✓CA ✓MA Closing balance = R42 690,69 + (– R237,82) = R42 452,87 **OR** ✓MA R37,81 + R200 + R0,01 = R237,82 credit ✓CA Total debit ✓MA = R200,00 + R4,00 + R31 716,69 + R10 770,00 = R42 690,69 ✓CA ✓MA Closing balance = R42 690,69 – R237,82 = R42 452,87	1MA adding credits 1CA simplification 1MA adding debits 1CA simplification 1MA adding credits to debits **OR** 1MA adding credits 1CA simplification 1MA adding debits 1CA simplification 1MA adding credits to debits [Using the Account Summary: Closing Balance = 42 690,69 – 200,01 – 37,81 = 42 452,87 **max 4 marks**] (5)	F L3
2.1.3	✓✓O Safety reasons **OR** prevent Fraud / Confidentially/ Account number private to Mr Son only	2O Explanation (2)	F L4
2.1.4	Insurance premium = R42 452,87 ÷ R1 000 ✓M = 42,45287 ✓CA ≈ 43 ✓R Insurance cost = 43 × R3,50 ✓MA = R150,50 ✓CA	1M dividing by 1 000 1CA simplification 1R rounding up 1MA multiplying correct values 1CA correct premium [not rounding up max 3 marks] (5)	F L3

Ques	Solution	Explanation	T/L
2.1.5	The bank owes Mr Son R 37,81 ✓✓O **OR** The account has a credit balance ✓✓O **OR** Over-payment from previous months. ✓✓O	2O reason (2)	F L4
2.1.6	Does not have large amounts of cash to purchase expensive goods ✓✓O **OR** Easier / convenient to settle expensive items with smaller monthly payments ✓✓O **OR** Loyalty points ✓✓O **OR** Safety ✓✓O **OR** Did not have money when he saw something he likes. ✓✓O **OR** To be able to see on what he spent his money. ✓✓O **OR** Credit card could be used in times of crisis. ✓✓O **OR** Some people use credit merely because it is easily accessible (available) ✓✓O **OR** To build a good credit record. ✓✓O **OR** He is using the interest free period. ✓✓O	2O reason (2)	F L4

Ques	Solution	Explanation	T/L
2.2	Distance = average speed × time ✓SF 34 km = 85 km per hour × time Time = 0,4 hours ✓A = 24 minutes ✓C Mr Son left home at 24 minutes before 12:10 = 11:46 ✓CA He did NOT leave at 11:40 ✓O **OR** Time diff. = 12:10 – 11:40 = 30 min = 0,5 hours ✓A ✓SF ✓CA Distance = 85 km/h × 0,5 h = 42,5 km more than 34 km✓O Mr Son did NOT leave at 11:40 but a bit later ✓O	1SF substitution of both values 1A time in hours 1C time in minutes 1CA simplification 1O conclusion **OR** 1A time in hours 1SF substitution 1CA distance 1O comparing 1O conclusion (5)	M L4
2.3.1	No data was available for Japan ✓✓O **OR** Japan did not provide data ✓✓O OR The books were not published in time ✓✓O	2O no data available (2)	Data L4
2.3.2	Range = maximum – minimum ✓M 463 223 = maximum – 4 612 ✓A Maximum = 463 223 + 4 612 = 467 835 ✓A	1M range concept 1A identifying minimum 1A calculating the maximum (3)	Data L2
2.3.3	✓MA 4 612; 6 373; 8 870; 24 177; 43 146; 47 352; 64 117; **76 434;** 77 910; 93 600 ; 95 483; 184 000; 304 912; 444 000; 467 835 ✓CA Median = 76 434 ✓✓CA	CA from2.3.2 1MA all values in correct order 1CA maximum value 2CA median **AO** (4)	Data L2
2.3.4	no mode ✓✓A	2A no mode (2)	Data L2

Ques	Solution	Explanation	T/L
2.3.5	7 countries ✓✓✓A	3A correct number of countries [Listing ALL 7 without counting **max 2 marks**] (3)	Data L2
2.3.6	$P = \frac{12}{15} \times 100\%$ ✓A ✓A $= 80\%$ ✓CA	1A numerator 1A denominator 1CA probability as a percentage (3)	Prob. L2
		[40]	

QUESTION 3 [36 MARKS]			
Ques	**Solution**	**Explanation**	**T/L**
3.1	Area of display = length × width = 48 inches × 36 inches ✓SF = 48 × 25 mm ✓C ÷ 10 × 36 × 25 mm ✓C ÷ 10 = 120 cm × 90 cm = 10 800 cm^2 ✓CA Total area of 25 displays = 10 800 cm^2 × 25 ✓M = 270 000 cm^2 ✓CA Amount of whiteboard paint needed = 270 000 cm^2 ✓M ÷ 50 cm^2 = 5 400 mℓ ✓CA ÷ 1 000 ✓C = 5,4 litres 5ℓ is not enough. ✓O **OR** 5 litres of paint can cover 5 ℓ × 1 000 = 5 000 m ℓ ✓C × 50 ✓M = 250 000 cm^2 ✓CA Area of display = length × width = 48 inches × 36 inches ✓SF = 48 × 25 mm ✓C ÷ 10 × 36 × 25 mm ✓C ÷ 10 = 120 cm × 90 cm = 10 800 cm^2 ✓CA Total area of 25 displays = 10 800 cm^2 × 25 ✓M = 270 000 cm^2 ✓CA 5 ℓ is NOT enough. ✓O **OR**	1SF substituting correct values 1C converting inches to mm 1C converting mm to cm 1CA area of one display 1M multiplying by 25 1CA calculating total area 1M working with ratio 1CA calculating paint used 1C converting to litres 1O conclusion **OR** 1C converting to mℓ 1M multiplying by 50 1CA area 1SF substitution 1C conversion to mm 1C conversion to cm 1CA one display board area 1M multiplying by 25 1CA total area 1O conclusion **OR**	M L4

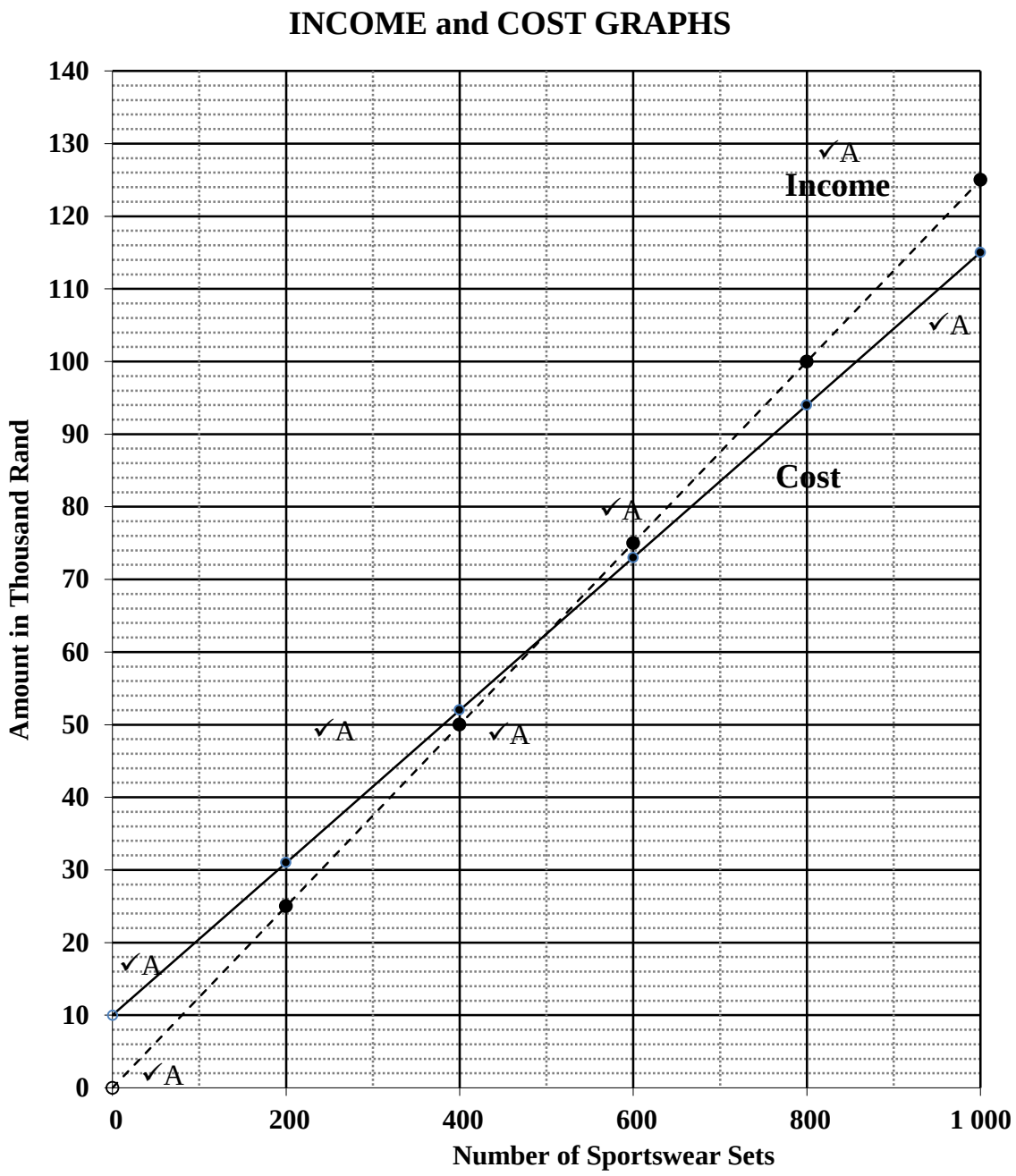
Ques	Solution	Explanation	T/L
	5 litres of paint can cover 5 ℓ × 1 000 ✓C = 5 000 m ℓ × 50 ✓M = 250 000 cm^2 ✓CA Display 48 × 25 mm = 1200 mm ✓C = 120 cm ✓C 36 × 25 mm = 900 mm = 90 cm Area = 120 cm × 90 cm ✓SF = 10 800 cm^2 ✓CA Spray paint is enough for = $\frac{250\ 000}{10\ 800}$ ✓M = 23,148 boards ✓CA 5 ℓ is not enough ✓O **OR** Area of display = 48 inches × 36 inches ✓SF = 1 728 $inches^2$ ✓CA = 1 728 × 625 mm^2 ✓C = 1 080 000 mm^2 =1 080 000 ÷ 100 cm^2 = 10 800 cm^2 ✓CA Total area of 25 displays = 10 800 cm^2 ✓M × 25 = 270 000 cm^2 ✓CA Amount of whiteboard paint needed = 270 000 cm^2 ✓M ÷ 50 cm^2 = 5 400 mℓ ✓CA ÷ 1 000 = 5,4 litres ✓C 5ℓ is not enough. ✓O	1C converting to mℓ 1M working with ratio 1CA calculating area that paint can cover 1C converting inches to mm 1C converting mm to cm 1SF substituting correct values 1CA area of one display board 1M dividing 1CA number of boards 1O conclusion **OR** 1SF substitution 1CA area in inches 1C converting to mm^2 1CA area of one display board 1M multiplying by 25 1CA total area 1M dividing by rate 1CA ml needs 1C converting to litre 1O conclusion (10)	

Ques	Solution	Explanation	T/L
3.2	Total Surface Area of cylinder A = π × diameter × height = 3,142 × 30 × 30 ✓SF = 2 827,80 cm^2 ✓CA Total Surface Area of decorative sticker for cylinder A = 2 827,80 cm^2 + (1 × 30) cm^2 ✓M = 2 857,80 cm^2 ✓CA Total Surface Area of cylinder B = π × diameter × height = 3,142 × 40 × 20 = 2 513,60 cm^2 ✓CA Total Surface Area of decorative sticker for cylinder B = 2 513,60 cm^2 + (1 × 20) cm^2 = 2 533,60 cm^2 ✓CA Correct, B will require less ✓O **OR** Total Surface Area of sticker for cylinder A = [(π × diameter) + 1] × height ✓M ✓M = [(3,142 × 30) + 1] × 30 ✓SF = 2 857,8 cm^2 ✓CA Total Surface Area of sticker for cylinder B = [(π × diameter) + 1] × height ✓SF = [(3,142 × 40) + 1] × 20 = 2 533,6 cm^2 ✓CA Correct, B will require less ✓O	1SF correct values 1CA calculating area 1M adding area of overlap 1CA calculating area of sticker 1CA area of cylinder B 1CA area of sticker B 1O conclusion **OR** 1M formula 1M for adding 1 to circumference 1SF substitution 1CA calculating area 1SF correct values 1CA calculating area 1O conclusion **[Max 5 marks if the overlap is left out]** (7)	M L4

Ques	Solution	Explanation	T/L
3.3.1	Easily accessible to all stands ✓✓R **OR** Would not waste any time looking for the stand.✓✓R **OR** Any other suitable reason	2R reason (2)	Maps L4
3.3.2	Maximum number of HEI from the USA = 6 × 6 ✓M ✓A = 36 ✓CA	1M multiplying by 6 1A correct USA's stands 1CA simplification **AO** (3)	Maps L2
3.3.3	$P_{(Not\ China)} = \frac{288}{324}$ ✓A ✓ A $= \frac{8}{9}$ **or** 0,89 **or** 88,89% ✓ CA **OR** $P_{(Not\ China)} = \frac{48}{54}$ ✓A ✓ A $= \frac{8}{9}$ **or** 0,89 **or** 88,9% ✓ CA **OR** $P_{(not\ China)} = \frac{54-6}{54} \times 100\%$ ✓M ✓A **OR** $P_{(Not\ China)} = 1 - \frac{6}{54}$ ✓M ✓A = 88,89% ✓ CA = $\frac{8}{9}$ ✓ CA	1A numerator 1A denominator 1CA simplification **OR** 1A numerator 1A denominator 1CA simplification **OR** 1M subtracting from whole 1A numerator 1CA simplification (3)	P L2
3.3.4	Delivery entrance 3 ✓✓A L01 ✓✓A	2A Delivery entrance 2A stand (4)	Maps L3
3.3.5	L 42 ✓✓A	2A stand number (2)	Maps L2

Ques	Solution	Explanation	T/L
3.3.6	Length of Information centre on plan = 70 mm ✓A Scale = 70 mm : 24 500 mm ✓C ✓M $= \frac{70\,\text{mm}}{70\,\text{mm}} : \frac{24\,500\,\text{mm}}{70\,\text{mm}}$ ✓M = 1 : 350 ✓CA **OR** Scale : 70 mm = 24,5 m ✓A ✓M 1mm = 0,35 m ✓M Scale = 1 : 350 ✓C ✓CA	1A measuring with ruler **(Accept a range of 66–74; dependant on provincial printing)** 1M concept of ratio 1C converting to same unit of measurement 1M dividing by 70 mm 1CA simplified scale **OR** 1A measurement 1M ratio concept 1M unit ratio 1C converting to like units 1CA simplified scale **NPR** (5)	Maps L3
		[36]	

QUESTION 4 [37 MARKS]			
Ques	**Solution**	**Explanation**	**T/L**
4.1.1 (a)	R105 = cost of T-shirt + cost of Shorts + printing ✓A ✓A ✓A = R50,00 + R35,00 + 2 × R10 OR = (R50 + R10) + (R35 + R10) = R60 + R45 ✓✓✓A	1A cost of T-shirt 1A cost of short 1A printing (3)	F L2
4.1.1 (b)	**Total cost** = R10 000 + R105 × 500 ✓SF = R62 500 ✓A	1SF substitution 1A simplification **AO** **[Using the selling price 0 marks]** (2)	F L2
4.1.2	87,5 thousand rand = R87 500 ✓A $A = \frac{R87\ 500,00}{R125,00}$ ✓M = 700 ✓CA $B = \frac{800 \times 125}{1\ 000}$ ✓M ✓A = 100 ✓CA **OR** ✓RT ✓M $A = \frac{500 \times 87,5}{62,5} = 700$ ✓CA ✓RT ✓M $B = \frac{800 \times 62,5}{500} = 100$ ✓CA **OR** A = 500 + 200 = 700 ✓✓✓A (because 25 + 62,5 = 87,5) B = 50 × 2 = 100 ✓✓✓A (because 400 × 2 = 800)	1A writing value in full 1M dividing 1CA value of A 1M multiplying by 125 1A dividing by 1 000 1CA value of B **OR** 1RT values from table 1M using ratio 1CA value of A 1RT values from table 1M using ratio 1CA value of B **OR** 3A value of A 3A value of B **AO** (6)	F L2

Ques	Solution	Explanation	T/L
4.1.3	 3 A for each graph (start point; any other point; correct straight line) 1A Graphs clearly labelled.		F L3 (7)

Ques	Solution	Explanation	Topic/L
4.1.4 (a)	Number of Sets = 500 ✓CA Income at break-even point = R62 500 or R62,5 thousand ✓CA	1CA number of sets 1CA income **[Accept values between R62 000 to R63 000]** (2)	F L3
4.1.4 (b)	Number of sets = 800 ✓✓✓RT **OR** x = number of sets Profit = Income – Expenses R6 000 = 125 × x – (10 000 + 105 × x) ✓M R6 000 = 20 x – R10 000 x = 800 ✓✓CA **OR** x = number of sets Income = 125 × x Expenses = 10 000 + 105 × x Profit = 20 x – R10 000 ✓M 20 x – R10 000 = R6 000 x = 800 ✓✓CA	3RT number of sets from graph (CA from graph) **OR** 1M using thousand rand 2CA number of sets **OR** 1M using thousand rand 2CA number of sets (3)	F L3

Ques	Solution	Explanation	T/L
4.2	**For Scale: 1 : 3** ✓M ✓A Total length of the set = 71 cm + 34 cm = 105 cm Scaled length of the set = 105 cm ÷ 3 ✓M = 35 cm ✓CA Length of page is 29,6 cm (does not fit) ✓O The width of the T-shirt = 57 cm Scaled width = 19 cm ✓O Hence the scale 1 **:** 3 should NOT be used **OR** **For Scale: 1 : 4** ✓M ✓A Total length of the set = 71 cm + 34 cm = 105 cm Scaled length of the set = 105 cm ÷ 4 ✓M = 26,25 cm ✓CA Length of page is 29,6 cm (does fit) ✓O The width of the T-shirt = 57 cm Scaled width = 14,25 cm The scale 1 **:** 4 SHOULD be used ✓O	1M adding lengths 1A total length 1M concept of ratio 1CA scaled length 1O does not fit 1O conclusion **OR** 1M adding lengths 1A total length 1M concept of ratio 1CA scaled length 1O does fit 1O conclusion (6)	**Maps** **L4**
4.3.1	Convenient ✓✓O **OR** Cheaper ✓✓O **OR** ✓✓O Save time to go to the shop / transport cost **OR** No need to drive and look and pay for parking ✓✓O **OR** Your purchases gets delivered to you ✓✓O **OR** Availability of stock in stores – if it is sold out. ✓✓O **OR** Greater choice ✓✓O	2O reason (2)	F L4

Ques	Solution	Explanation	Topic/L
4.3.2	✓A Electronics 51% – 43% = 8% ✓M ✓A Sports equipment 44% – 36% = 8%	1A Electronics 1A Sports equipment 1M difference of 8% (3)	F L2
4.3.3	Groceries ✓A Fresh produce like bread and milk is immediately available. ✓✓O **OR** ✓✓O Wrong items will not be delivered to your home **OR** You can pay cash for your groceries ✓✓O **OR** You can taste or test some products before you buy them. ✓✓O **OR** Frozen goods may melt before they reach you. ✓✓O **OR** Better comparison can be made if you buy groceries in store. ✓✓O **OR** ✓A Clothing and footwear - it has to be tried to see whether it fits correctly. ✓✓O **OR** ✓A Jewellery – to fit the size of a ring. ✓✓O **OR** ✓A Electronic goods – it can be tested in the shop before buying. ✓✓O **OR** Or any other items where instore graph is higher than the internet graph with a valid reason.	1A Item 2O opinion (3)	F L4
		[37]	
		TOTAL: 150	