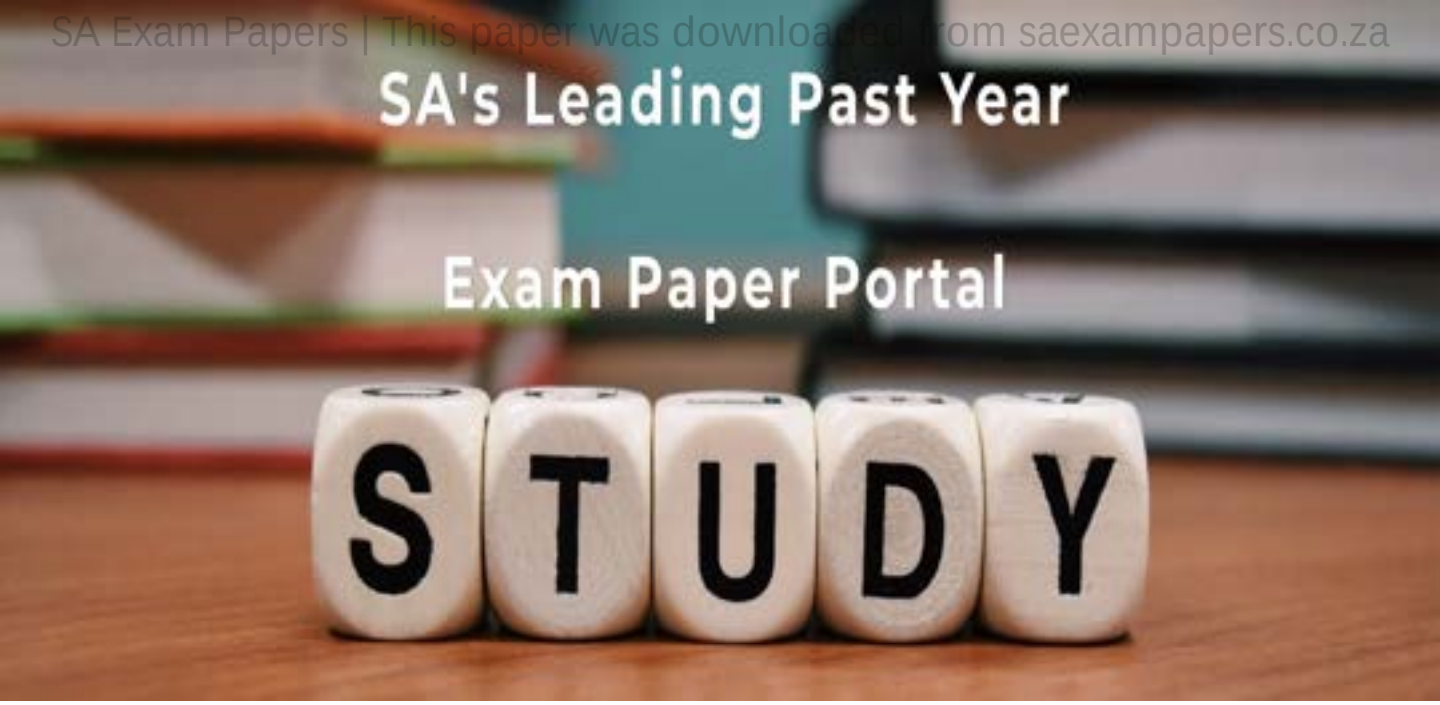

Province of the
EASTERN CAPE
EDUCATION

NATIONAL SENIOR CERTIFICATE

GRADE 12

SEPTEMBER 2023

MATHEMATICAL LITERACY P2
MARKING GUIDELINE

MARKS: 150

Symbol	Explanation
M	Method
MA	Method with accuracy
CA	Consistent accuracy
RCA	Rounding consistent accuracy
A	Accuracy
C	Conversion
S	Simplification
SF	Correct substitution in a formula
J	Justification
O	Opinion/Example/Definition/Explanation/Justification/Verification
RT/RG/RM	Reading from a table/graph/map
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

This marking guideline consists of 11 pages.

MARKING GUIDELINES

NOTE:

- If a candidate answers a question TWICE, only mark the FIRST attempt.
- If a candidate has crossed out (cancelled) an attempt to a question and NOT redone the solution, mark the crossed out (cancelled version).
- Consistent Accuracy (CA) applies in ALL aspects of the marking guidelines; however, it stops at the second calculation error.
- If the candidate presents any extra solution when reading from a graph, table, layout plan and map, then penalise for every extra incorrect item presented.

NASIENRIGLYNE

LET WEL:

- *As 'n kandidaat 'n vraag TWEE keer beantwoord merk slegs die EERSTE poging.*
- *As 'n kandidaat 'n antwoord van 'n vraag doodtrek (kanselleer) en nie oordoen nie, merk die doodgetrekte (gekanselleerde) poging.*
- *Volgehoue akkuraatheid (CA) word in ALLE aspekte van die nasienriglyn toegepas, maar dit hou by die tweede berekeningsfout op.*
- *Wanneer 'n kandidaat aflees van 'n grafiek, tabel, uitlegplan en kaart en ekstra antwoorde gee, penaliseer vir elke ekstra item.*

KEY TO TOPIC SYMBOL:
F = Finance; M = Measurement; MP = Maps, plans and other representations; P= Probability

QUESTION 1 [31]

Quest	Solution	Explanation	Level
1.1.1	The distance around the boundary ✓ ✓ O **OR** The distance around the edges of a shape ✓ ✓ O (Accept any relevant explanation)	2O correct explanation (2)	M L1
1.1.2	Distance = 144,69 km − 105 km ✓ MA = 39,69 km ✓ A	1MA subtracting correct values 1A correct answer (2)	M L1
1.1.3	60 km : 45 km (÷ 15 km) ✓MA 4 : 3 ✓ A	1MA dividing by 15 km 1A correct answer (2)	M L1
1.1.4	✓ C 144,69 km × 1 000 000 = 144 690 000 mm ✓ A	1C conversion 1A correct answer (2)	M L1
1.1.5	C ✓ ✓ A	2A correct letter (2)	M L1
1.2.1	✓A (+1 day) February; March (31 days)+ April (30 days) = 62 days ✓CA	1A correct number of days 1CA correct answer (2)	M L1
1.2.2 (a)	Washing powder (3 kg) ✓ MA R 129,99 ÷ 30 = R 4,33 per load ✓ A	1MA dividing by 30 1A correct answer (2)	M L1
1.2.2 (b)	Washing powder (2 kg) ✓ MA R84,99 ÷ 2 = R 42,495 per kg ✓ = R42,50	1MA dividing by 2 1A correct answer (2)	M L1

1.2.3	3 kg : 30 loads 4 kg $= \frac{4 \text{ kg} \times 30 \text{ loads}}{3 \text{ kg}}$ ✓ M = 40 loads ✓ A	1M conversion ratio 1A correct number of loads (2)	M L1
1.2.4	Maximum purchase in kg: $\frac{3}{4} \times 2\,000$ ✓C = 1 500 grams ✓ A	1 C convert kg to grams 1A correct answer (2)	M L1
1.3.1	The distances on the right of the N7 indicate the distances travelling from Cape Town to Keetmanshoop. ✓✓ A	2A correct explanation (2)	MP L1
1.3.2	✓ RM 995 km × 1 000 = 995 000 m ✓ C	1RM correct distance 1C conversion to m (2)	MP L1
1.3.3	✓ RM ✓ M 995 km – 300 km + 2 km = 693 km ✓CA	1RM correct distance 1M subtracting and adding 1CA simplification (3)	MP L1
1.3.4	B 1 ✓✓ RM	2RM correct answer (2)	MP L1
1.3.5	6 towns ✓✓ RM	2RM correct answer (2)	MP L1
		[31]	

QUESTION 2 [25]			
Quest.	**Solution**	**Explanation**	**Level**
2.1.1	Every 1 unit on the diagram represents 15 units in real life. ✓✓ A	2A correct explanation (2)	MP L1
2.1.2	✓ M $\frac{37,5}{100} \times 1,2 = 0,45$ m ✓ MA	1M correct method 1MA correct answer (2)	MP L2
2.1.3	Scale 1 : 15 ✓MA 1m in actual size $= \frac{1}{15} = 0,0667$ m on the plan Height of chair $= 1,2 \times 0,0667$ ✓M $= 0,08$ m ✓ S $= 8$ cm ✓ C Width of chair $= 0,6 \times 0,0667$ $= 0,04$ m $= 4$ cm ✓ C **OR** Height of model $= \frac{1}{15} \times 1,2$ m $= 0,08$ m $= 8$ cm	1MA ratio scale 1M multiply by 1,2 1S for 0,08 1C convert to cm 1C convert to cm (5)	MP L2
2.2	Length side of box: Convert cm to mm ✓ M $1,4 \times 10 = 14$ mm ✓ C ✓M 85 mm ÷ 14 mm = 6,07 ✓ MA ≈ 6 soap bars ✓ A **OR** Convert mm to cm ✓ M 85 mm ÷ 10 = 8,5 cm ✓ C ✓ M 8,5 cm ÷ 1,4 cm = 6,07 ✓ MA ≈ 6 soap bars ✓ A **OR** Length = 8,5 ÷ 8,35 = 1,02 ✓ M Width = 5,6 ÷ 5,5 = 1,02 ✓ A Height = 8,4 ÷ 1,4 = 6 ✓ A Total soap bars = 1,02 × 1,02 × 6 = 6,2424 ✓ CA ≈ 6 soap bars ✓ A	 1M multiply by 10 1C correct value 1M divide by 14 1MA correct answer 1A maximum number of soap bars 1M divide by 10 1C correct value 1M divide by 1,4 1MA correct answer 1A maximum number of soap bars 1M dividing 1A correct value 1A correct value 1CA correct value 1A total soap bars (5)	MP L3

2.3.1	Bar scales can be used to determine actual lengths and distances without doing many calculations. ✓✓O **OR** When maps and plans are re-sized, the bar scale is also re-sized and remains accurate. ✓✓ O **OR** **Accept any other relevant explanation.**	2O correct explanation (2)	MP L1
2.3.2	Bar scale measurement = 34 mm or 3,4 cm ✓ A Map distance = 79 mm or 7,9 cm Bar Scale 3,4 cm : 450 ✓ M $= \frac{7,9 \times 450}{3,4}$ ✓ M $= \frac{3\,555}{3,4}$ =1045,588 km ✓ CA = 1 046 km ✓ R	1A correct measurement 1M using scale 1M multiply by 450 1CA simplification 1CA for distance in km 1R correct value (5)	MP L2
2.3.3	South West ✓✓ RM	2RM correct direction (2)	MP L2
2.3.4	Two Islands ✓✓ O	2O reason (2)	MP L4
		[25]	

QUESTION 3 [32]			
Quest	**Solution**	**Explanation**	**Level**
3.1.1	Number of batches: $= 80 \div 16$ ✓ M = 5 batches ✓ CA	 1M divide by 16 1CA total batches (2)	M L1
3.1.2	✓ MA ✓ MA (5× 35 min) + 15 min = 190 min ✓A Conversion of 190 min = 3h 10 min ✓C 16:45 – 3h10 ✓M = 13: 35 ✓ CA	 2MA adding 15 min and 175 min cooking time 1A total time 1C converting time 1M subtraction 1CA starting time (6)	M L2
3.1.3	°C = (°F − 32) ÷ 1,8 = (330 – 32) ÷ 1,8 ✓SF = 298 ÷ 1,8 = 165,555 ✓CA = 170 °C ✓R	 1SF correct substitution 1CA simplification 1R correct answer (3)	M L2
3.1.4	**Needs:** $\frac{1}{2}$ cup = 16 brownies No of cups $= \frac{80 \times 0,5}{16}$ = 2,5 cups ✓A 1 cup = 226 grams 2,5 cups = 565 grams ✓A **Frosting**: 3 tablespoons = 16 servings 80 servings = 15 tablespoons ✓ CA 1 tablespoon = 14 grams 15 tablespoons = 210 grams ✓CA **Total needed**: = 565 g + 210 g ✓M = 765 g **Miss Nolan has**: 2,5 blocks = 250 g × 2,5 ✓M = 625 g ✓A She does not have enough butter to make 80 Brownies. ✓ O	 1A for 2,5 cups needed 1A for 565 grams needed 1CA for 15 tablespoons 1CA for 210 grams 1M adding values 1M correct values 1A correct answer 1O conclusion	M L4

	OR Needs: $\frac{1}{2}$ cup + 3 teaspoons ✓M = 113 g + (14 g × 3) ✓M = 113 g + 42 g ✓S = 155 g ÷ 16 × 80 ✓C = 775 g needed ✓A ✓M $2\frac{1}{2}$ × 250 g = 625 g ✓ A Miss Nolan needed more butter (775 −625) ✓O ≈ 150 g	1M multiplying 3 × 14 g 1M adding grams 1S simplifying 1C conversion ratio 1A correct answer 1M correct values 1A correct answer 1O conclusion (8)	
3.2.1	Area of square pan in cm^2 1 inch = 2,54 cm 8 inches = 8 × 2,54 ✓MA = 20,32 cm ✓A Area of square pan = side × side = 20,32 × 20,32 ✓ SF = 412,9024 cm^2 ✓ CA One square brownie = $\frac{412,9024}{16}$ ✓ M = 25,8064 = 25,81 cm^2 ✓ CA	 1MA conversion ratio 1A correct answer 1SF correct substitution 1CA simplification 1M divide by 16 1CA correct answer (6)	M L3
3.2.2	✓M 80% × 80 = 64 ✓A Number left = 80 – 64 ✓M = 16 ✓A	1M use percentage 1A correct value 1M subtraction 1A correct answer (4)	M L2
3.2.3	Number of brownies sold: number of brownies left 64 : 16 ✓A ✓A = 4 : 1 ✓CA	 1A correct values 1A correct order 1CA simplification (3)	M L2
		[32]	

QUESTION 4 [25]			
Quest	**Solution**	**Explanation**	**Level**
4.1.1	✓ RT ✓M 5,793 × 35 = 202,755 ✓CA = 203 km	1RT lap distance 1M multiply correct values 1CA simplification (3)	MP L1
4.1.2	It is directly across the finishing line ✓✓ O	2O correct explanation (2)	MP L4
4.1.3	Grandstand 12 or 18 (accept both values) ✓✓ RT	2RT correct answer (2)	MP L1
4.2.1	Elapsed time = 1 min 27 sec – 1 min 18,887 ✓M = 8,113 sec ✓A = 8 sec ✓R	1M subtracting time 1A correct answer 1R correct rounding (3)	M L1
4.2.2	1lap = 5,793 km Time: 1 min 18,887 sec Conversion to metres 5.793 × 1000 = 5793 m ✓C Time: 1 min 18,887 sec Conversion to seconds = 60 + 18,887 = 78,887 sec ✓C Average Speed = $\frac{\text{Distance in m}}{\text{Time in sec}}$ = $\frac{5\,793}{78,887}$ ✓SF = 73,434 ✓CA ≈ 73 m / sec ✓A	 1C convert to m 1C convert to seconds 1SF substitution 1CA simplification 1A correct answer (5)	M L3
4.3.1	BMI = $\frac{73\text{ kg}}{1,74 \times 1,74}$ ✓C ✓SF = $\frac{73}{3,0276}$ ✓S = 24,11 kg/m^2 ✓CA	1C for 1,74 m 1SF correct substitution 1S simplification 1CA correct answer (4)	M L2
4.3.2	✓M Weight of race car = 2002,14 pounds ÷ 2,205 = 908 kg ✓MA ✓M ✓M Total car weight = 908 – 73 – 110 = 725 kg ✓CA Neither Jody nor Benjamin is correct. ✓O	1M divide by conversion ratio 1MA correct value 2M subtracting 73 and 110 1CA simplification 1O conclusion (6)	M L4
		[25]	

QUESTION 5 [37]			
Quest	**Solution**	**Explanation**	**Level**
5.1.1 (a)	0,5 inch = 12,7 mm (×2) 1inch = 25,4 mm ✓ C 23 inches = 23 × 25,4 = 584.2 mm ✓CA = 58,42 cm ✓ C $\frac{model\ bee}{actual\ bee} = \frac{58{,}4\ cm}{2\ cm}$ ✓ M = 29,2 ≈ 29 times bigger ✓ J	1C inch to mm 1CA simplification 1C convert to cm 1 M dividing by 2 1 J correct conclusion (5)	MP L3
5.1.1 (b)	58,42 cm : 2 cm ✓ M 29,21 : 1 (÷2) ≈ 29 : 1 ✓ A	**CA from (a)** 1M correct ratio format 1A correct answer (2)	MP L1
5.1.2	$\frac{B}{10\ km} = \frac{1\ h}{24\ km}$ B = $\frac{1\ h \times 10\ km}{24\ km}$ ✓ M = 0,4166666 h = 0,4166666 × 60 min = 25 min = 25 × 60 sec ✓ C = 1 500 sec ✓ CA Number of wings beats in 10 km = 1500 × 200 ✓ M = 300 000 ✓ A	1M correct method C convert to sec 1CA simplifying 1M multiplying 1A correct answer (5)	MP L4

5.2.1	Perimeter = 12 m + 6 m + 5,5 m + 5,5 m ✓ M = 29 m ✓ MA	1M adding correct values 1MA simplification (2)	M L1
5.2.2	**Area of triangle = $\frac{1}{2}$(base) × height × 2** = $\frac{1}{2}$(3) × 4 × 2 ✓ SF = 12 m ✓ A **Area of circle = π × (radius)^2** = 3,142 × (0,75 m)^2 ✓ A✓ SF = 1,767375 m^2 ✓ CA **Area of rectangular = L× B** = 6 × 4 = 24 m^2 ✓ A **Vegetable garden area** = 36 – 1,77 ✓ M = 34,23 m^2 ✓CA	1SF correct values 1A correct answer 1A correct radius 1CA simplification 1SF substitution 1A correct answer 1M subtracting 1CA correct answer (8)	M L2
5.2.3	**Volume of water tank = π × (radius)^2 × height** 8,84 m^3 = 3,142 × (0,75 m)^2 ✓ SF 8,84 m^3 = 1,767375 m^2 × height ✓ SF $\frac{8,84}{1,767375}$ = 1 × height ✓ S 5,001 = height ✓CA 5 m = height ✓ R	1SF for radius value 1SF substitute 1S simplification 1CA correct value 1R rounding (5)	M L2
5.3.1 (a)	A = 660 ✓ A B = 10% × 360 ✓ MA = 36 ✓ MA C = 360 – 36 ✓ M = 324 ✓ A	1A correct value 2MA correct method 1M subtract values 1A correct answer (5)	P L1
5.3.1 (b)	Probability balloon (heart) = $\frac{36}{360}$ ✓ A ✓ A	1A numerator 1A denominator (2)	P L2
5.3.2	Probability free rose = $\frac{360}{660}$ ✓ A = $\frac{6}{11}$ ✓ A	1A numerator 1A denominator 1A simplified form (3)	P L3
		[37]	
		TOTAL: 150	