KWAZULU-NATAL PROVINCE

EDUCATION
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

MATHEMATICAL LITERACY

COMMON TEST

MARCH 2023

MARKS: 100

TIME: 2 hours

This question paper consists of 10 pages, and an Addendum with 2 Annexures.

INSTRUCTIONS AND INFORMATION

1. This question paper consists of FOUR questions. Answer ALL the questions.

2. Use the ANNEXURES in the ADDENDUM to answer the following questions:

   ANNEXURE A for QUESTION 1.1.
   ANNEXURE B for QUESTION 2.2.

3. Number the answers correctly according to the numbering system used in this question paper.

4. Start EACH question on a NEW page.

5. You may use an approved calculator (non-programmable and non-graphical), unless stated otherwise.

6. Show ALL calculations clearly.

7. Round off ALL final answers appropriately according to the given context, unless stated otherwise.

8. Indicate units of measurement, where applicable.

9. Write neatly and legibly.

QUESTION 1

1.1
> Nombuso has an account with Standard Bank. ANNEXURE A shows
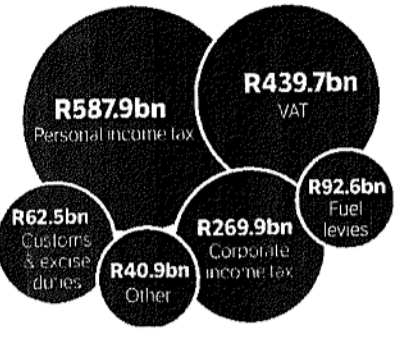> an extract of her bank statement.

Use ANNEXURE A to answer the questions that follow.

1.1.1 Define the word *"debit"* according to the given context above.   (2)

1.1.2 Determine the number of days covered by the statement.   (2)

1.1.3 Write down the statement frequency.   (2)

1.1.4 Show how the total VAT amount of R38,09 was determined.   (2)

1.2   A summary of 2022/2023 government income and expenditure is given below.

Income		Expenditure	
		Sector	**Amount (in billion rand)**
TAX AT A GLANCE Projected tax revenue 2022/2023		Economic Development	R227,1
R587.9bn Personal income tax	R439.7bn VAT	Learning and Culture	R441,5
R62.5bn Customs & excise duties	R92.6bn Fuel levies	Peace and Security	R220,7
R40.9bn Other	R269.9bn Corporate income tax	Health	R259,0
		General Public Service	R 69,2
		Community Development	R236,3
		Debt Service Costs	R301,8
		Contingency Reserve	R 10,0
		Social Development	R364,4
TOTAL	**R1 493,5**	**TOTAL**	**R2 130**

[Extract: www.treasury.gov.za]

Use the information above to answer the following questions.

1.2.1   Identify the type of tax which is the biggest source of revenue for the state.   (2)

1.2.2   Write the amount received from personal income tax as a number in millions.   (2)

1.2.3   Show how the total income was determined.   (3)

1.2.4   Calculate the state deficit and write the figure in full.   (3)

1.2.5   If a sector is chosen at random, determine the probability that the expenditure amount is greater than R200 billion.   (2)

[20]

QUESTION 2

2.1

> Prince Mchunu owns a house in Johannesburg built on a stand that is 1 550 m². Sewer monthly charge depends on the size of the stand.
>
> **TABLE 1 below shows the 2022/2023 water and sewer tariffs for Johannesburg Municipality. N.B: Tariff rates exclude 15% VAT.**
>
> | Residential Water Tariff | | Sewer Monthly Charge (VAT Incl.) | | |
> |---|---|---|---|---|
> | Kilolitres | R/kℓ | Block | Stand Size (m²) | Monthly Charge |
> | 0 - 6 | - | 1. | Up to and including 300m² | R 307,42 |
> | +6 - 10 | R22,26 | | | |
> | +10 - 15 | R23,23 | 2. | More than 300m² to 1000m² | R 598,44 |
> | +15 - 20 | R32,57 | | | |
> | +20 - 30 | R45,01 | 3. | More than 1000m² to 2000m² | R 905,33 |
> | +30 - 40 | R49,23 | | | |
> | +40 - 50 | R62,11 | | | |
> | +50 | R66,56 | 4. | More than 2000m² | R1 304,42 |
>
> Source: [www.joburg.org.za]

NOTE: Stand is a plot size

Use the given information and TABLE 1 above to answer the following questions.

2.1.1 Determine the sewer monthly charge for Prince Mchunu. (2)

2.1.2 Match the items in Column A with items in Column B. Write the number and letter ONLY.

A	B
(i) VAT	X: 90 533 cents
(ii) Amount Excluding VAT	Y: Value Added Tax
(iii) R905,33	Z: (Amount Including VAT) ÷ 1,15

(3)

2.1.3 Calculate the sewer monthly VAT amount charged for Prince Mchunu's stand size. (2)

2.1.4 Prince Mchunu's household used 24 kℓ of water in January 2023 because of the wedding celebration.

Calculate the total amount Prince Mchunu paid for water and sewer including 15% VAT. (6)

2.2

> Prince Mchunu applied for a loan of R30 000 from Direct Axis. Loan conditions are given below.
>
> Once-off initiation fee: R1 207,50
> Monthly loan service fee: R69,00
> Interest rate: 28% p.a compounded monthly
> Monthly repayment: R1 891,16 (including monthly service fee)
> Loan term: 2 years
>
> **N.B: Once-off initiation fee can be paid upfront or be added to the monthly repayment. Prince paid it upfront.**
>
> ANNEXURE B shows the interest incurred, payments made and balance owed over the loan term until the loan is fully paid.
>
> **Source: www.directaxis.co.za**

Use the information above and ANNEXURE B to answer the following questions.

2.2.1	Calculate the monthly interest rate as a percentage. Do not round off.	(2)
2.2.2	Calculate the real cost of the loan.	(3)
2.2.3	Prince claimed that the total interest on the loan was exactly R7 903. Verify his claim with calculations.	(5)

2.3

> The annual inflation rate for 2022 was 5,73% and the projected annual inflation rates for 2023 and 2024 are 4,65% and 4,6% respectively. The price of cooking oil (5ℓ) for 2022 was R229,99 at Pick n Pay.
>
> **Source: www.pnp.co.za**

Use the given information above to answer the following questions.

2.3.1	Using the 2022 price of cooking oil and the 2022 inflation rate, calculate what the same 5 litres of cooking oil cost in 2021.	(3)
2.3.2	Calculate what the expected price of cooking oil (5ℓ) will be in 2024 using the given inflation rates.	(4)
		[30]

QUESTION 3

3.1

> Bongani, aged 32, earns a basic salary of R35 700 per month. He is married with 3 children and belongs to a medical aid scheme.

Use the information above to answer the questions that follow.

3.1.1   Determine Bongani's annual taxable income if he contributes 7.5% of the basic salary towards his pension fund each month.   (4)

3.1.2   Calculate Bongani's annual tax if he receives a rebate of R16 425 per year and a medical aid credit of R815 per month for his entire family.

You may use the following formula:

Annual Tax – Rebate – Medical aid credit for the year

= [73 726 + (31% of the taxable income above R353 000)] – Rebate – Medical aid credit for the year   (6)

3.1.3   Now determine Bongani's monthly tax.   (2)

3.2

South African Revenue Service reported to the media that R1, 564 trillion tax revenue was received in 2022. TABLE 2 below shows the tax revenue received by SARS from 2019 to 2022.

TABLE2: TAX REVENUE RECEIVED BY SARS FROM 2019 TO 2022

R"million	2019/20⁶	2020/21⁵	2021/22⁶
Personal Income Tax¹	529 172	488 446	555 780
Corporate Income Tax¹	214 986	204 399	323 577
Dividends Tax / STC	27 930	24 845	33 397
Value-added Tax	346 761	331 197	390 697
Domestic VAT	399 288	392 936	448 782
Import VAT	179 987	166 454	204 332
VAT Refunds	-232 515	-228 193	-262 417
Specific Excise Duties²	46 827	32 273	49 552
Fuel Levy	80 175	75 503	88 877
Customs Duties²	55 428	47 290	57 970
Other taxes	54 502	45 800	63 914
Total Tax Revenue	1 355 781	1 249 753	1 563 765

[Adapted source: www.sars.gov.za]

Use the information in TABLE 2 above to answer the questions that follow.

3.2.1   Write R1, 564 trillion as a number in full.   (2)

3.2.2   Determine the difference between the reported tax received and the actual tax received in 2021/2022.   (3)

3.2.3   Calculate the percentage change in the tax received from 2019/20 to 2020/21.   (4)

3.2.4   Show by calculation how the Value-added Tax of 390 697 was determined.   (2)

3.2.5   Write down the ratio of the corporate income tax to personal income tax in 2021/22.   (2)

[25]

QUESTION 4

4.1

The data in TABLE 3 below is taken from 2019 National Senior Certificate exam report.

TABLE 3: NUMBERS OF LEARNERS WHO WERE IN GRADE 2 IN 2009 AND THE MATRIC PASS RATE IN 2019.

Province	Grade 2 in 2009	Grade 11 in 2018	Wrote matric in 2019	Passed matric 2019	Matric Pass rate	Provincial Ranking
Eastern Cape	179,461	109,870	63,198	48,331	76.5%	7
Free State	52,781	39,755	25,572	22,602	88.4%	1
Gauteng	145,109	132,676	97,829	85,342	87.2%	2
KwaZulu Natal	222,656	218,915	116,937	95,017	81.3%	5
Limpopo	117,786	128,755	70,847	51,855	73.2%	9
Mpumalanga	80,631	75,563	43,559	34,995	80.3%	6
Northern Cape	23,417	15,623	9,138	6,990	76.5%	3
North West	68,567	45,454	26,819	23,272	86.8%	7
Western Cape	81,847	61,066	50,404	41,502	82.3%	4
NATIONAL	972,255	827,677	504,303	403,606	81.3%	

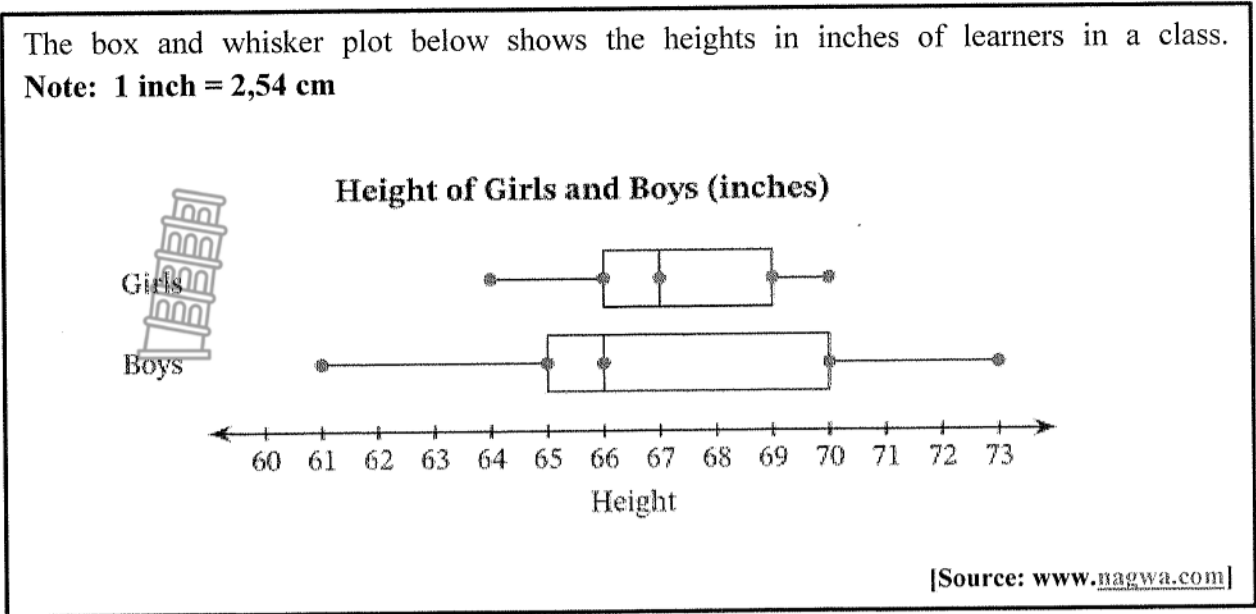[Adapted source www:groundup.org.za]

Use the information in TABLE 3 above to answer the questions that follow.

4.1.1   Determine the percentage of learners from Grade 2 in 2009 who passed matric in 2019 in South Africa. (4)

4.1.2   Determine the name of the province with the median matric pass rate in 2019. (2)

4.1.3   Calculate the average (mean) number of learners who passed matric in 2019. (4)

4.1.4   Which measure of central tendency is a better representation of the data: mean or median? Give a reason for your answer. (3)

4.2 | The box and whisker plot below shows the heights in inches of learners in a class.
Note: 1 inch = 2,54 cm

Height of Girls and Boys (inches)

Girls

Boys

60 61 62 63 64 65 66 67 68 69 70 71 72 73

Height

[Source: www.nagwa.com]

Use the information above to answer the following questions.

4.2.1 Determine the difference in the median height of the learners in inches. (3)

4.2.2 Calculate the inter quartile range for the height of the girls in inches.

You may use the formula:

IQR = Q3 – Q1 (3)

4.2.3 A learner stated that 25% of girls' height was equal to 50% of the boys' height.

Verify if this statement is CORRECT. (3)

4.3 | A survey was conducted amongst learners who participate in sport. TABLE 3 below shows the number of girls and boys who participate in sport.

TABLE 3: LEARNER PARTICIPATION IN SPORT

	SWIMMING	SOCCER	ATHLETICS	TOTAL
GIRLS	5	12	17	34
BOYS	11	3	7	21
TOTAL	16	15	24	55

4.3.1 Determine the probability, as a decimal, of a girl participating in swimming. (3)

[25]

TOTAL: [100]

ANNEXURE A

QUESTION 1.1

ESHOWE 7630
MONTHLY EMAIL

Statement No: 11
Page 5 of 5
Statement Frequency: Monthly

Statement from 08 October 2022 to 08 November 2022

BANK STATEMENT / TAX INVOICE

ELITE CURRENT ACCOUNT

| | | | Account Number | 1010 919 ### # |

Details	Service Fee	Debits	Credits	Date	Balance
BALANCE BROUGHT FORWARD					14,779.26
FEE - PRE-PAID TOP UP	##	0.50-		11 03	14,778.76
IMMEDIATE PAYMENT		9,200.00-		11 03	5,578.76
67982100 R NGWENYA					
FEE IMMEDIATE PAYMENT	##	50.00-		11 03	5,528.76
PRE-PAID PAYMENT TO		15.00-		11 03	5,513.76
MTN PREPAID 0825015755					
FEE - PRE-PAID TOP UP	##	0.50-		11 03	5,513.26
FEE: PAYMENT CONFIRM - SMS	##	1.35-		11 03	5,511.91
RAKESH NOOKHAI					
CHEQUE CARD PURCHASE		57.90-		11 04	5,454.01
ESHOWE 2 4451*4762 02 NOV					
CHEQUE CARD PURCHASE		29.90-		11 04	5,424.11
ESHOWE 2 4451*4762 02 NOV					
AUTOBANK CASH WITHDRAWAL AT		2,050.00-		11 05	3,374.11
0000D967 2022-11-05T07:39:38 44					
IB PAYMENT FROM			3,800.00	11 07	7,174.11
DUMISANI					
IB PAYMENT TO		3,800.00-		11 07	3,374.11
BIDORBUY LAPTOP					
CHEQUE CARD PURCHASE		150.00-		11 08	3,224.11
SASOL ESHOWE 4451*4762 04 NOV					

These fees include VAT at 14% up to 31 March 2018 and at 15% from 1 April 2018.

VAT Summary

Total charge amount (excluding VAT)	253.46-
Total VAT	38.09-
Total charge amount (including VAT)	291.55-

Account Summary

Details of Agreement	
Balance at date of statement	3,224.11

[Extract: Nombuso's bank statement]

ANNEXURE B

QUESTION 2.2

Month	1	2	3	4	5	6	7	8	9	10	11	12
Interest	700	672,21	643,76	614,66	584,87	554,39	523,20	491,28	458,62	425,19	390,99	355,98
Payment	1891,16	1891,16	1891,16	1891,16	1891,16	1891,16	1891,16	1891,16	1891,16	1891,16	1891,16	1891,16
Balance	28808,84	27589,89	26342,49	25065,99	23759,70	22422,93	21054,97	19655,09	18222,55	16756,58	15256,41	13721,23

Month	13	14	15	16	17	18	19	20	21	22	23	24
Interest	320,16	283,51	245,99	207,61	168,32	128,12	86,99	44,89	1,81			
Payment	1891,16	1891,16	1891,16	1891,16	1891,16	1891,16	1891,16	1891,16	C			
Balance	12150,23	10542,58	8897,41	7213,86	5491,02	3727,98	1923,81	77,54	0			

[Adapted from Prince's loan statement]

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MARKING GUIDELINE

MARCH 2023

MARKS: 100

SYMBOL	EXPLANATION
M	Method
MA	Method with accuracy
CA	Consistent accuracy
A	Accuracy
C	Conversion
S	Simplification
RT/RG/RD/RM	Reading from a table/ graph/ diagram/Map
SF	Correct substitution in a formula
O	Opinion/ reason/deduction/example/Explanation
J	Justification
R	Rounding off
F	deriving a formula
AO	Answer only full marks
P	Penalty e.g. for units, incorrect rounding off etc.
NPR	No penalty for rounding / units
D	Correct definition

This marking guideline consists of 8 pages.

QUESTION 1 [20 MARKS] AO FULL MARKS

QUE	Solution	Explanation	T&L
1.1.1	Money deducted from Nombuso's account✓✓A **OR** Accept any valid definition relating to the context.	2A correct definition (2)	F L1
1.1.2	32 days✓✓A	2A correct number of days (2)	F L1
1.1.3	Monthly✓✓A	2A correct frequency (2)	F L1
*1.1.4	✓RT VAT = R291,55 − R253,46✓M = R38,09	1RT for R291,55 1M for subtraction (2)	F L1
1.2.1	Personal Income Tax✓✓A	2A answer (2)	F L1
1.2.2	R587 900 million✓✓A	2A answer (2)	F L1
1.2.3	$\quad\quad\quad$✓M$\quad\quad\quad\quad$✓M Total = R587,9 bn + R439,7bn + R269,9bn + R92,6b + 62,5bn $\quad$+R40,9✓M $\quad$= R1 493,5 bn	1M first pair 1M second pair 1M third pair (3)	F L1
1.2.4	Deficit = R1 493,5bn − R2 130bn✓M $\quad\quad$= (R636,5bn)✓A $\quad\quad$= (R636 500 000 000)✓CA	1M subtracting 1A answer 1CA answer in full (3)	F L1
*1.2.5	P(greater than R200 billion) = $\dfrac{7^{✓A}}{9}$✓A	1A for numerator 1A for denominator (2)	P L1
		[20]	

QUESTION 2 [30 MARKS]

2.1.1	R905,33✓✓RT	2RT answer (2)	F L1
2.1.2	(i) Y✓A (ii) Z✓A (iii) X ✓A	1A for Y 1A for Z 1A for X (3)	F L1

2.1.3	VAT = R905,33 − (R905,33 ÷ 1,15)✓M
	      = R905,33 − R787,24
	      = R118,09✓A
	
	 OR
	
	 VAT = R905,33 × (15 ÷ 115)✓M
	     = R118,09✓M
		1M dividing 1.15
		 1A answer
		
		 OR
		
		 1M dividing 115
		 1A answer (2)
			F L2

2.1.4	Charge = 4(22,26) + 5(23,23) + 5(32,57) + 4(45,01)✓✓M
	      = R548,08✓A
	              ✓M
	 Total Payment = R548,08 × 1,15 + R905,33✓M
	          = R1 535,62✓CA
	
	 OR
	
	 Charge = 4(22,26) + 5(23,23) + 5(32,57) + 4(45,01)✓✓M
	
	     = R548,08✓A
	
	 VAT = 15% × R548,08
	     = R82,21✓M
	 Total Payment = R548,08 + R82,21 + R905,33✓M
	       = R1 535,62✓CA
		2M for adding all correct values
		 1A answer
		 1M multiplying by 1,15
		 1M adding R905,33
		 1CA answer
		 OR
		 2M for adding all correct values
		
		 1A answer
		
		 1M for VAT
		 1M for adding
		 1CA answer (6)
			F L3

2.2.1	Monthly interest rate = 28% ÷ 12✓M = 2,333333333%✓A	1M dividing by 12 1A answer (2)	F L2
2.2.2	✓M Real Cost of Loan = 20(R1 891,16) + R79,35 + R1 207,50✓M = R39 110,05✓A	1M multiplying by 20 1M adding R79,35 and R1 207,50 1A answer (3)	F L2

2.2.3	✓M ✓M
	Interest = 20(R1 891,16) + R79,35 − R30 000✓M
	          = R7 902,55✓A
	The claim is NOT valid✓O
	
	OR
	
	✓M ✓M
	
	Interest = (R39 110,05 − 1207.50) − R30 000
	          = R7 905,55✓A
	
	The claim is NOT valid✓O
		1M multiplying
		1M adding
		1M subtracting
		1A correct answer
		1O conclusion
		
		OR
		
		1M multiplying
		1M adding
		1M subtracting
		1A correct answer
		1O conclusion
		                        (5)
			F
			L4

2.3.1	✓M
	2021 Price = R229,99 ÷ 105,73%✓M
	          = R217,53✓A
	
	OR
	
	2021 Price = R229,99 × $\dfrac{100✓M}{105,73✓M}$
	          = R217,53✓A
		1M dividing
		1M for dividing by 105,73%
		1A answer
		
		OR
		
		1M for multiplying by 100
		1M for 105,73
		1A answer (3)
			F
			L2

2.3.2	Price for 2022 = R229,99
	Price for 2023 = R229,99 × 104,65%✓M
	          = R240,68✓A
	Price for 2024 = R240,68 × 104,6%✓M
	          = R251,75✓CA
	
	OR
	✓M
	2023 Increase = 4,65% × R229,99
	          = R10,69
	Price for 2023: R229,99 + R10,69 = R240,68✓A
	2024 Increase = 4,6% × R240,68
	          = R11,07✓M
	Price for 2024 = R240,68 + R11,07
	          = R251,75✓CA
		1M multiplying by 104.65%
		1A answer
		1M multiplying by 104.6%
		1CA answer
		
		OR
		
		1M multiplying by 4.65%
		1A answer
		
		1M multiplying by 4.6%
		
		1CA answer
		                        (4)
			F
			L3

		[30]	

QUESTION 3 [25MARKS]

QUE	Solution	Explanation	T &L
3.1.1	Monthly taxable income = R35 700 – (R35 700 × 7.5%)✓MA = R33 022,50✓A Annual taxable income = R33 022,50 × 12 ✓MA = R396 270✓A	1MA subtracting 7,5% 1A correct answer 1MA multiplying by 12 1A correct value (4)	F L2
3.1.2	Annual Tax ✓SF ✓M ✓MCA ✓SF ✓MA =[73 726 + (31% (396 270 - R353 000)] – 16 425 – (815 ×12) =R60 934,70✓CA	**CA from 3.1.1** 1SF annual taxable income 1M multiplying by 31% 1MCA subtracting values 1SF rebate 1MA subtracting medical credit for the year 1CA answer (6)	F L3
3.1.3	Monthly tax = R60 934,70 ÷ 12 ✓MCA = R5 077.89 ✓CA	**CA from 3.1.2** 1MCA dividing by 12 1CA answer (2)	F L2
3.2.1	1 564 000 000 000✓✓A	2A correct answer (2)	F L2
*3.2.2	Difference =R 1 564 000 000 000 – 1 563 765 000 000✓✓MCA =R235 000 000✓CA	2MCA subtracting correct values 1CA answer (3)	F L2
3.2.3	✓MA % Change = $\frac{1\ 249\ 753 - 1\ 355\ 781}{1\ 355\ 781 ✓MA} \times 100$ %✓M = - 7,82 %✓CA	1MA subtracting correct values 1MA dividing by 1 355 781 1M multiply by 100% 1CA answer (4)	F L2
3.2.4	✓MA ✓MA Value added tax = (448 782 + 204 332) – 262 417 = 390 697	1MA adding correct values 1MA subtracting 262 417 (2)	F L2
*3.2.5	323 577: 555 780✓✓RT	2RT correct values and order (2)	F L2
			[25]

QUESTION 4 [25 MARKS]

QUE	Solution	Explanation	T &L
4.1.1	Percentage $= \dfrac{403\,606}{972\,255} \checkmark RT \times 100\% \checkmark M$ ✓RT $= 41{,}51\ \% \checkmark CA$	1RT correct value 1RT dividing by correct value 1M multiply by 100% 1CA answer (4)	DH L2
4.1.2	Median $= 73.2;\ 76.5;\ 76.5;\ 80.3;\ 81.3;\ 82.3;\ 86.8;\ 87.2;\ 88.4 \checkmark A$ $= $ KwaZulu Natal ✓A	1A arranging values 1A correct answer (2) **AO**	DH L2
*4.1.3	Mean $= (48\,331 + 22\,602 + 85\,342 + 95\,017 + 51\,855 +$ $34\,995 + 6\,990 + 23\,272 + 41\,502) \div 9 \checkmark M$ ✓✓M $= 45\,545{,}1$ $= 45\,545 \checkmark CA$	2M adding correct values 1M dividing by 9 1CA answer (4)	DH L2
4.1.4	Median ✓ A Data set has an outlier of 6 990. ✓✓O	1A Correct answer 2O opinion (3)	DH L4
4.2.1	Difference $= 67 – 66 \checkmark\checkmark RG$ $= 1$ inch ✓CA	2RG subtracting correct values 1CA answer (3)	DH L4
4.2.2	IQR $= 69 – 66 \checkmark RG \checkmark SF$ $= 3 \checkmark CA$	1RG correct values 1SF substitution 1CA answer (3)	DH L3

4.2.3	Q_1 of girls = 66 ✓RG Q_2 of boys = 66✓RG The statement is CORRECT. ✓O	1RG correct value 1RG correct value 1O opinion (3)	DH L2
4.3.1	P(Girl swimming) = $\dfrac{5}{16}$ ✓A ✓A = 0,3125✓CA	1A for numerator 1A for denominator 1CA correct answer (3) **NPR**	
			[25]
		TOTAL MARKS:	**100**

NOTES:

- 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 item presented.

1.1.4	VAT = R253,46 × 15% = R38,02	Full marks
1.2.5	Accept 0,778 **OR** 77,8%	Full marks **NPR**
3.2.2	Accept R235 million	Full marks
3.2.5	323 577: 555 780 1:1,71	Full marks
4.1.3	Mean = 4 03 606 ÷ 9 = 44 845,11 = 44 845	Full marks