



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

SENIOR CERTIFICATE EXAMINATIONS

MATHEMATICAL LITERACY P1

2017

MARKS: 150

TIME: 3 hours

This question paper consists of 12 pages, 1 answer sheet and an addendum with 4 annexures.

INSTRUCTIONS AND INFORMATION

1. This question paper consists of FIVE questions. Answer ALL the questions.
2. 2.1 Use the ANNEXURES in the ADDENDUM to answer the following questions:

ANNEXURE A for QUESTION 2.1
ANNEXURE B for QUESTION 2.2
ANNEXURE C for QUESTION 4.2
ANNEXURE D for QUESTION 5.1

2.2 Answer QUESTION 5.1.6 on the attached ANSWER SHEET.

2.3 Write your centre number and examination number in the spaces on the ANSWER SHEET. Hand in the ANSWER SHEET with your ANSWER BOOK.
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. Maps and diagrams are NOT necessarily drawn to scale, unless stated otherwise.
10. Write neatly and legibly.

QUESTION 1

1.1

Tyrone buys chocolates in bulk to make gift baskets containing different chocolate bars to sell. He buys boxes that contain bars of Peppermint Crisp, Bar-One, Kit Kat and Cadbury 80 g chocolate slabs.

Picture of a gift basket with chocolate bars



- 1.1.1 Determine the total price of a box with Peppermint Crisp bars if there are 40 bars in a box and the unit price of a bar is R8,70. (2)
- 1.1.2 Explain the term *profit*. (2)
- 1.1.3 A box with Kit Kat bars costs R435,04. To determine the selling price, Tyrone increases the cost price by 40%. Determine the amount that he adds to the cost price. (2)
- 1.1.4 Tyrone makes a gift basket containing the following items:

ITEMS	UNIT COST PRICE
Bar-One	R10,04
Peppermint Crisp	R8,70
Kit Kat	R20,66
Cadbury 80 g chocolate slab	R6,73
Empty basket	R29,99

- (a) Determine the total cost price of the gift basket. (3)
- (b) He sells 230 of these gift baskets and receives a total income of R22 770.

Determine the selling price of each gift basket. (2)

1.2

Mr Piedt earns an annual taxable income of R542 096,76.

TABLE 1 below is a tax table that shows how much personal income tax he needs to pay.

**TABLE 1: INCOME TAX RATES FOR INDIVIDUALS
2017 TAX YEAR (1 MARCH 2016–28 FEBRUARY 2017)**

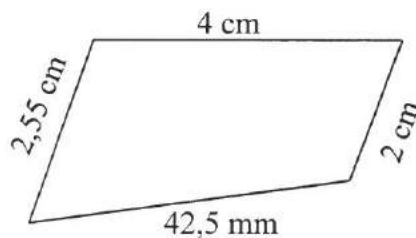
TAX BRACKET	TAXABLE INCOME (R)	TAX RATES (R)
1	0–188 000	18% of taxable income
2	188 001–293 600	33 840 + 26% of taxable income above 188 000
3	293 601–406 400	61 296 + 31% of taxable income above 293 600
4	406 401–550 100	96 264 + 36% of taxable income above 406 400
5	550 101–701 300	147 996 + 39% of taxable income above 550 100
6	701 301 and above	206 964 + 41% of taxable income above 701 300

Adapted from www.SARS.gov.za

- 1.2.1 What does the acronym *SARS* stand for? (2)
- 1.2.2 Write down the minimum amount of tax payable for tax bracket 3. (2)
- 1.2.3 Calculate Mr Piedt's average monthly taxable income. (2)
- 1.2.4 Identify the tax bracket applicable to Mr Piedt's taxable income. (2)

1.3

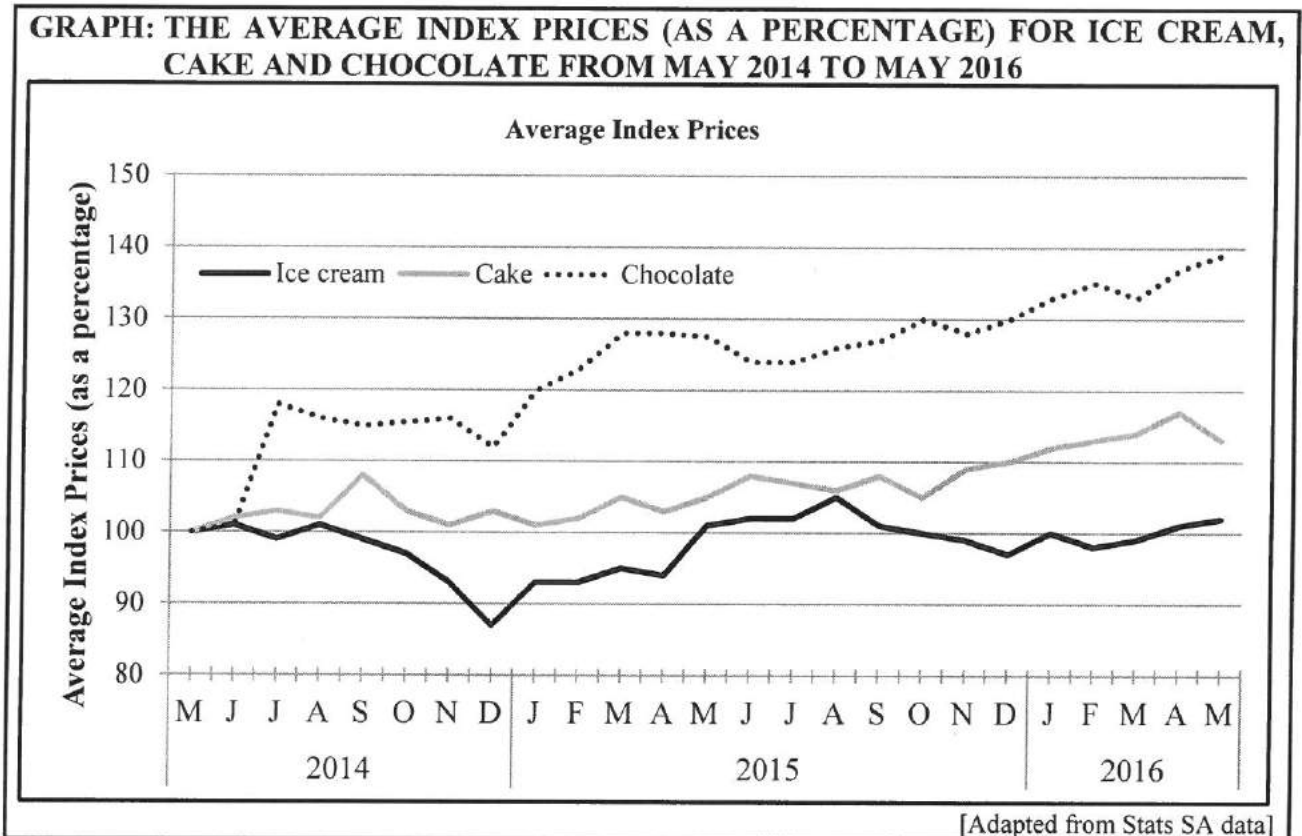
A scaled drawing of a piece of land, using a scale of 1 : 200, is shown below.



- 1.3.1 Explain the meaning of this scale. (2)
- 1.3.2 Calculate the perimeter (in centimetre) of the scaled drawing of the piece of land. (3)

- 1.4 Stats SA has released data showing that the average price of an 80-gram slab of chocolate has risen by 39% from May 2014 to May 2016.

The graph below shows indexes used to compare the average price of an 80-gram slab of chocolate with the average prices for cake and ice cream. The average index price, as at May 2014, was taken as 100%.



Study the graph above to answer the questions that follow.

- 1.4.1 Give the date when the average index price for chocolate was 120%. (2)
- 1.4.2 Describe the change in the average price of cake from April 2016 to May 2016. (2)
- 1.4.3 Write down the average index price for ice cream for October 2015. (2)
- [30]

QUESTION 2

2.1

Amooh Siya has a savings account at CPT Bank. On ANNEXURE A is a statement for the period 22/10/2015 to 20/12/2015. Some of the amounts have been omitted.

Use the information on ANNEXURE A to answer the questions that follow.

- 2.1.1 Determine the balance in the savings account on 22/10/2015. (2)
- 2.1.2 Calculate the monthly interest amount on 31/10/2015. (2)
- 2.1.3 To prevent fraud, the bank omits the last four digits from the account number. Give an example of a possible account number for this statement. (2)
- 2.1.4 Name the person who transferred an amount of money into this account. (2)
- 2.1.5 Write down the number of unprocessed transaction items on this statement. (2)
- 2.1.6 Determine the probability of randomly selecting a transaction from this statement that was made from 1 December 2015 to 20 December 2015. (2)
- 2.1.7 The total VAT inclusive amount on this statement is R19,60.
- (a) Show how this amount was calculated. (2)
- (b) Calculate the VAT amount for R19,60. (3)

2.2

During 2016 the Msunduzi municipality released its approved budget for the 2016/2017 financial year. An extract from the consolidated budget is given in ANNEXURE B. Some of the amounts have been omitted. Note that all amounts reflected are in thousands of rand.

Use the information in ANNEXURE B to answer the questions that follow.

- 2.2.1 Name the item that gives the Msunduzi municipality the most income. (2)
- 2.2.2 Calculate the difference between the total income of the preaudit outcome and the original budget for 2015/16. (2)
- 2.2.3 Write down the expected income from service charges for 2016/17 in billions, rounded off to ONE decimal place. (3)
- 2.2.4 Determine the missing value **B**. (3)
- 2.2.5 Calculate the missing value **A** and state whether it is a surplus or a deficit. (5)
- 2.2.6 Calculate the percentage increase in councillors' remuneration from 2015/16 to 2016/17.

You may use the following formula:

$$\text{Percentage increase} = \frac{\text{Difference in remuneration}}{\text{Original budgeted remuneration}} \times 100\% \quad (3)$$

[35]

QUESTION 3

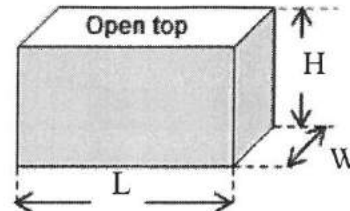
3.1

Rian has a factory that manufactures rectangular plant boxes with different sizes.

PICTURE OF RECTANGULAR PLANT BOXES



DIAGRAM OF THE BOX



A table showing boxes with different sizes (all external dimensions in mm):

TYPE OF PLANT BOX	LENGTH (L)	WIDTH (W)	HEIGHT (H)
A	325	325	225
B	325	325	325
C	600	325	600
D	1 200	325	462,5
E	1 500	475	462,5

You may use the following formulae:

Area of a rectangle = length \times width

Volume of a rectangular prism = length \times width \times height

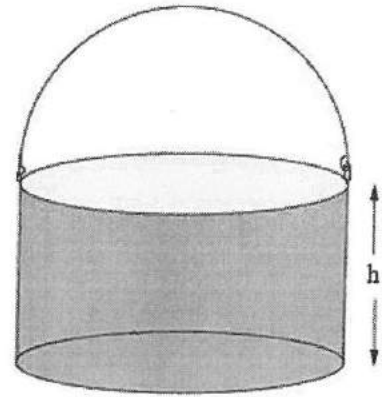
- 3.1.1 Write down the letter (A–E) of the type of plant box that is a cube. (2)
- 3.1.2 Calculate the area (in cm^2) of the base of box D. (4)
- 3.1.3 The area of the base of box A is $1\,056,25\text{ cm}^2$. Determine the total area (in cm^2) needed to store 24 of these boxes if they are stacked on top of each other in a double layer. (3)
- 3.1.4 Determine, for box type C, the ratio of the length of the box to the width of the box in simplified form. (3)
- 3.1.5 A municipality bought 148 type E boxes. The inside volume of a type E box is approximately $0,299\text{ m}^3$. They also ordered compost to fill these boxes. The compost is delivered in 6 m^3 truckloads.
- (a) The inside volume of a box is 9,36% less than the outside volume. Show how the approximated inside volume was calculated. (5)
- (b) Calculate the number of boxes that can be filled with 6 cubic metres of compost. (3)
- (c) Determine the minimum number of truckloads of compost required to fill ALL the boxes. (3)

3.2

A $20\,000\text{ cm}^3$ cylindrical bucket has a diameter of $10\frac{1}{2}$ inches.

NOTE:

1 inch = 2,54 cm



3.2.1 Determine the radius (in inches) of the cylindrical bucket. (2)

3.2.2 Determine the height (in cm) of the cylindrical bucket.

You may use the following formula:

$$h = \frac{\text{Volume (in cm}^3\text{)}}{\frac{1}{4} \times \pi \times (\text{diameter in cm})^2} \quad \text{using } \pi = 3,142$$

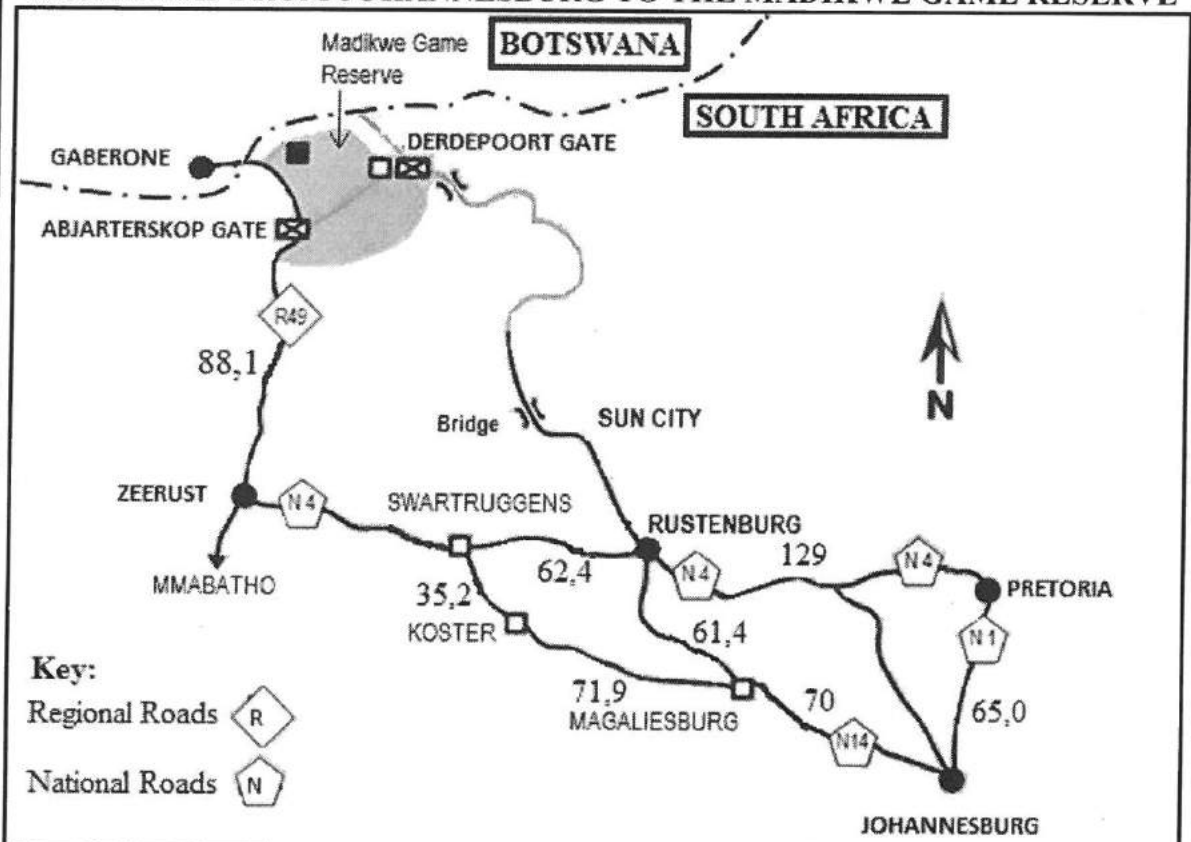
(3)
[28]

QUESTION 4

4.1 A group of tourists drove from Johannesburg to the Madikwe Game Reserve and planned to enter the game reserve at the Abjarterskop Gate.

Below is a map indicating the routes, cities or towns and distances (in kilometres) between the places.

ROUTE MAP FROM JOHANNESBURG TO THE MADIKWE GAME RESERVE



[Adapted from <http://www.infomap.co.za/wp-content/uploads/2016/02/SA-NP-Map>]

Use the information and the route map above to answer the questions that follow.

- 4.1.1 Give the general direction of the Madikwe Game Reserve from Johannesburg. (2)
- 4.1.2 State what the broken line (---) represents on the map. (2)
- 4.1.3 Name the shortest route that could be used to drive from Johannesburg to the Abjarterskop Gate. (3)
- 4.1.4 Calculate the distance between Zeerust and Swartruggens if the total route distance from Rustenburg to the Abjarterskop Gate is 221,2 km. (3)
- 4.1.5 Determine the shortest route distance from Johannesburg to Swartruggens. Show ALL calculations. (3)

4.2

The group of tourists also visited the Kgalagadi Transfrontier Park. The layout plan of the Twee Rivieren Camp is given in ANNEXURE C.

This camp offers two types of accommodation:

- Camping facilities (for tents)
- Cottages

Use the layout plan on ANNEXURE C and the information above to answer the questions that follow.

- 4.2.1 Identify on which side of the road they will find the reception building after they entered the gate. (2)
- 4.2.2 If each of the cottages can accommodate 3 guests, calculate the maximum number of guests that can be accommodated in ALL the cottages in the camp. (3)
- 4.2.3 Explain in detail the route a person should follow to walk from the picnic site to the swimming pool. (3)
- 4.2.4 The visitors booked a drive activity. Determine the probability that the activity booked was NOT a night drive. (2)
- [23]

QUESTION 5

5.1 A survey published by the Department of Education reported on the number of schools, learners and teachers in ordinary public schools and independent schools during 2013.

TABLE 3 in ANNEXURE D shows the number of learners, teachers and schools in South Africa.

NOTE: Some data have been omitted.

Use TABLE 3 to answer the questions that follow.

5.1.1 Which province had the second lowest number of learners? (2)

5.1.2 Determine the total number of teachers in South Africa for 2013. (3)

5.1.3 Calculate the percentage of schools found in KwaZulu-Natal. (3)

5.1.4 Use the formula below and determine the LSR for Gauteng.

$$\text{Learner-School Ratio} = \frac{\text{Total number of learners}}{\text{Total number of schools}} \quad (3)$$

5.1.5 Use the provincial LTR to answer the following.

(a) Write down the modal ratio. (2)

(b) Arrange the ratios in descending order. (2)

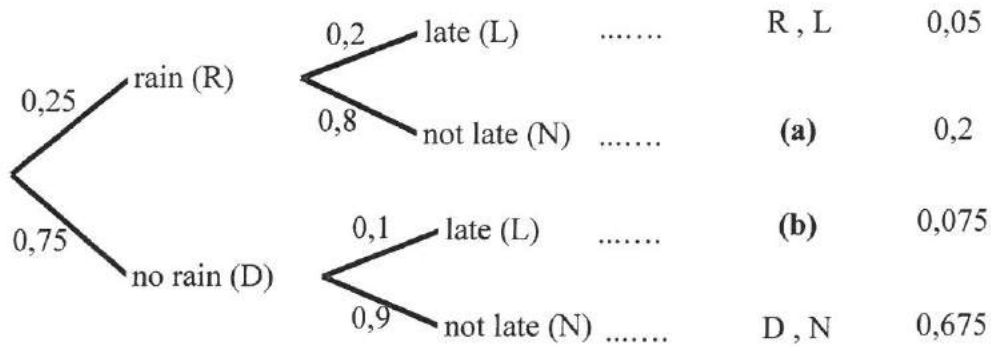
(c) Determine the median ratio. (2)

5.1.6 Use the TSR to complete the bar graphs on the attached ANSWER SHEET. (6)

5.2

A school kept records of all the learners that arrived late for school. The Mathematical Literacy teacher noticed that the late arrival is influenced by the occurrence of rain.

The tree diagram below was drawn to show the outcomes and probability of late arrivals when the chance for rain is 25%.



[Adapted from SASAMS 2016]

Study the tree diagram and answer the questions that follow.

- 5.2.1 Write down the percentage of learners who arrives late if it does not rain. (2)
- 5.2.2 Write down the missing outcomes **(a)** and **(b)**. (4)
- 5.2.3 Write down the probability (as a simplified common fraction) of randomly selecting a learner who arrived late for school on a rainy day. (2)
- 5.2.4 If the school has 1 562 learners, determine how many learners will not be late if the chance for rain is 25%. (3)

[34]

TOTAL: 150

ANSWER SHEET

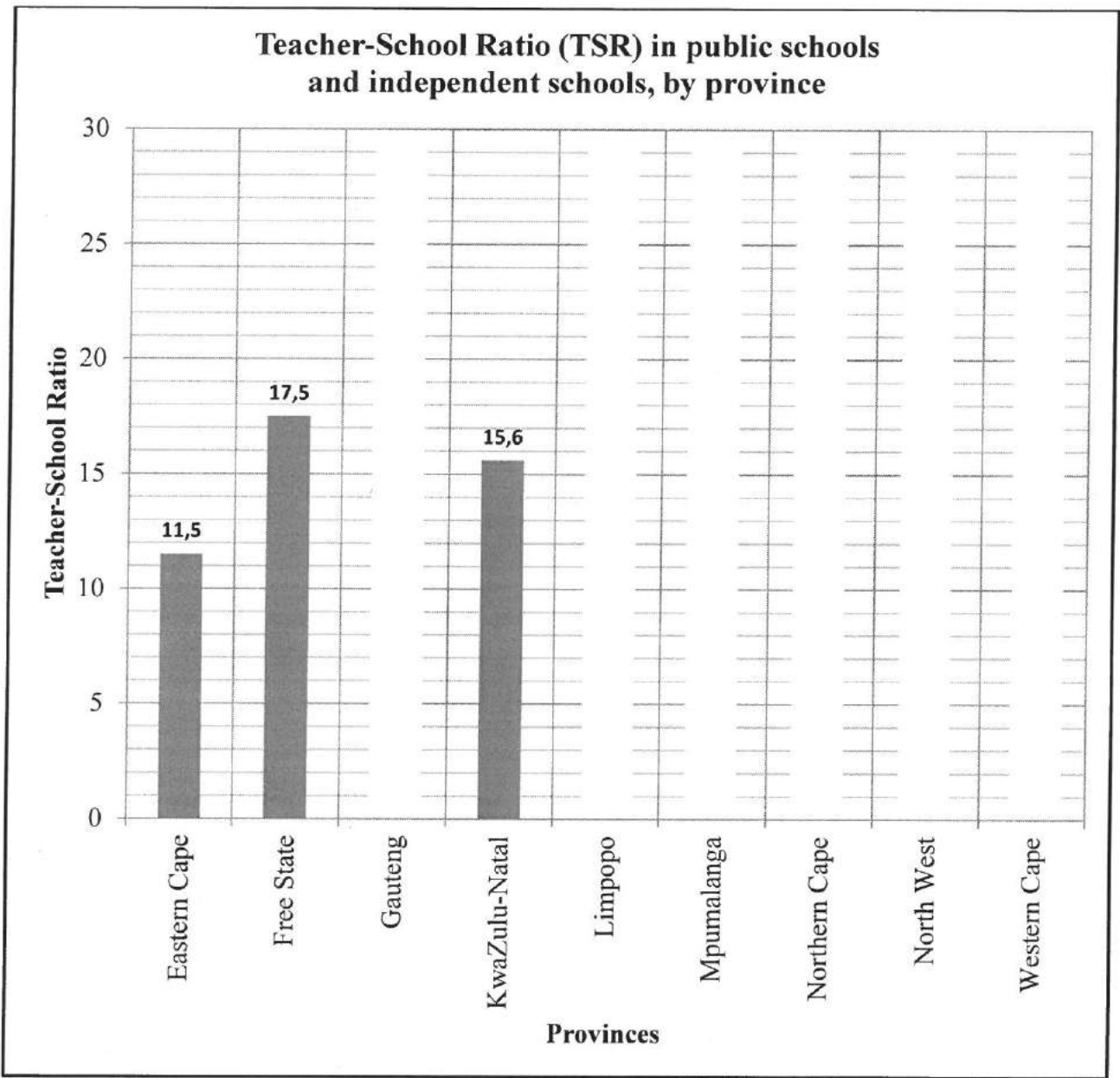
QUESTION 5.1.6

CENTRE NUMBER:

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EXAMINATION NUMBER:

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ADDENDUM

2017

This addendum consists of 5 pages with 4 annexures

ANNEXURE A

QUESTION 2.1

Savings Account Statement

CPT Bank Limited
1 Quantum Street
Techno Park
Stellenbosch 7600

From Date: 22/10/2015
To Date: 20/12/2015

Personal Details
 Mrs Amoooh Siya
 37 Madiba Avenue
 Bloemfontein 9001

Account Number: 14326****

Transaction Date	Description	Money In (R)	Money Out (R)	Balance (R)
23/10/2015	Mdlalose		600,00	8 060,27
23/10/2015	#Payment Fee		1,50	8 058,77
23/10/2015	Sandile		3 120,00	4 938,77
23/10/2015	#Payment Fee		1,50	4 937,27
23/10/2015	Annari		898,60	4 038,67
23/10/2015	#Payment Fee		1,50	4 037,17
23/10/2015	#SMS Notify Fee		0,40	4 036,77
23/10/2015	#SMS Notify Fee		0,40	4 036,37
23/10/2015	#SMS Notify Fee		0,40	4 035,97
23/10/2015	#SMS Update Fee		1,20	4 034,77
31/10/2015	Monthly Interest	---		4 050,98
31/10/2015	#Monthly Admin Fee		5,00	4 045,98
24/11/2015	Print Gift		3 625,00	420,98
24/11/2015	#Payment Fee		1,50	419,48
24/11/2015	#SMS Notify Fee		0,40	419,08
24/11/2015	#SMS Update Fee		0,40	418,68
27/11/2015	Transfer from 15100; Mdiso Khaile	230,00		648,68
27/11/2015	#SMS Update Fee		0,40	648,28
30/11/2015	Monthly Interest	12,08		660,36
30/11/2015	#Monthly Admin Fee		5,00	655,36

End

Transactions not yet processed on your account up to 20/12/2015

There are no Unprocessed Transaction Items

Cheques not yet processed on your account up to 20/12/2015

There are no Unprocessed Cheque Items

14% VAT inclusive in the amount

ANNEXURE B

QUESTION 2.2

**TABLE 2: EXTRACT FROM THE MSUNDUZI CONSOLIDATED BUDGET.
ALL AMOUNTS IN THOUSANDS OF RAND**

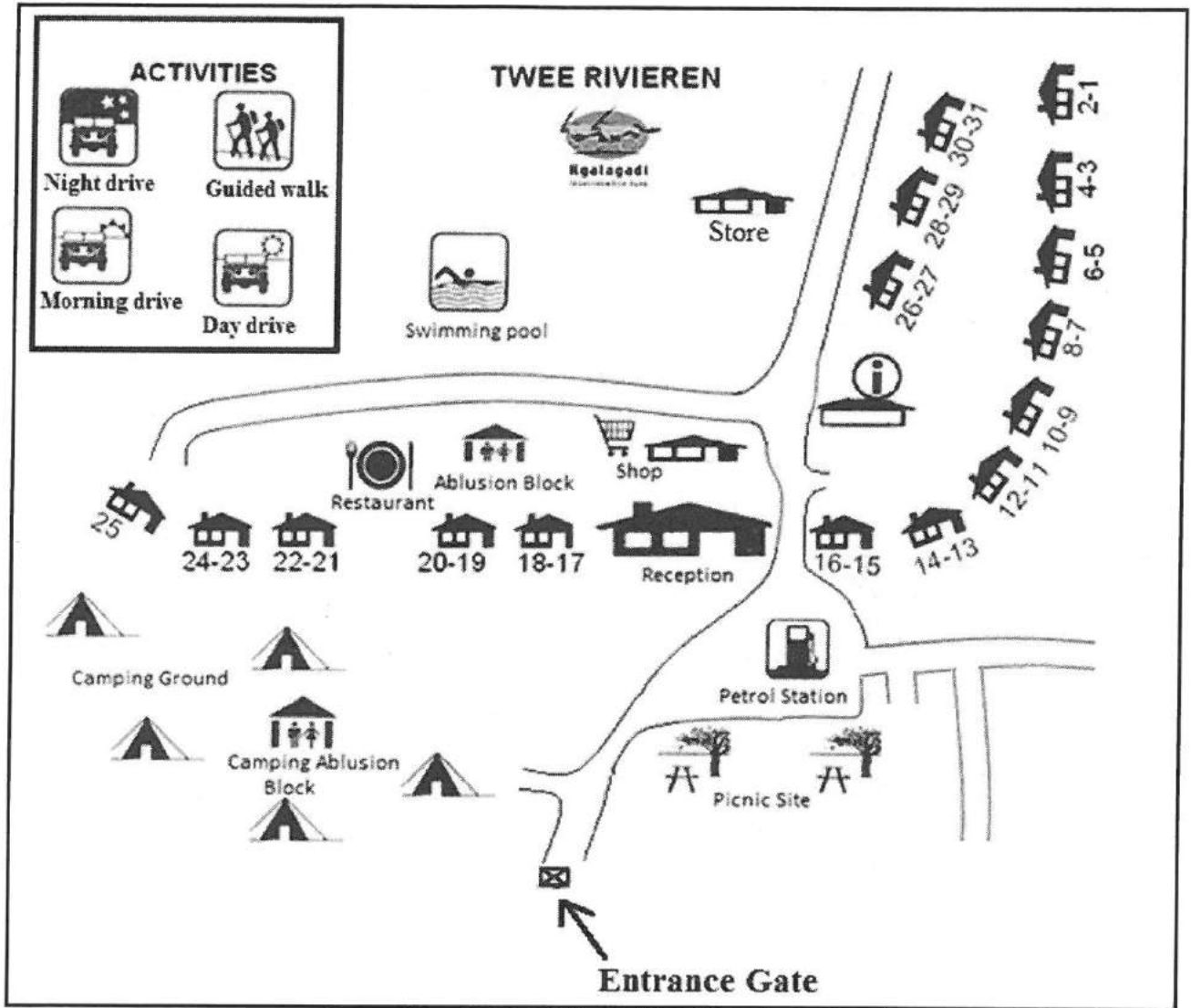
Description	2013/14	2014/15	Current Year 2015/16		2016/17 Medium-term Income and Expenditure Framework Plan	
	Audited	Audited	Original Budget	Pre-audit outcome	Budget Year 2016/17	Budget Year 2017/18
<u>Income</u>						
Property rates	625 627	716 603	784 462	794 866	842 558	893 111
Service charges	2 073 501	2 227 636	2 694 542	2 694 542	2 878 830	3 116 589
Investment income	43 343	51 027	34 044	34 044	49 330	52 243
Transfer cost	448 122	519 604	440 652	B	489 491	530 153
Other income	293 743	312 290	211 525	211 526	212 797	221 307
Total Income	3 484 336	...	4 165 225	4 253 219	4 473 006	4 813 403
<u>Expenditure</u>						
Employee costs	824 585	886 355	961 335	961 335	1 040 938	1 101 367
Remuneration of councillors	37 100	34 657	42 350	42 350	43 033	45 615
Depreciation and asset impairment	453 359	481 980	487 299	487 299	507 298	569 317
Finance charges	67 196	71 180	69 501	69 501	65 474	58 263
Materials and bulk purchases	1 592 462	1 780 120	1 967 839	1 982 214	2 118 107	2 311 745
Transfers and grants	218	238	128 362	128 362	140 526	153 542
Other expenditure	636 659	875 072	507 212	567 289	538 193	520 498
Total Expenditure	3 611 579	...	4 163 898	4 238 350	4 453 569	4 760 347
Surplus/(Deficit)	(127 243)	A	1 327	14 870	19 436	53 055

[Adapted from Msunduzi Budget for 2016/2017]

ANNEXURE C

QUESTION 4.2

LAYOUT PLAN OF THE TWEE RIVIEREN CAMP



[Adapted from <https://www.sleeping-out.co.za/ftp/Maps>]

NOTE:



means cottage number 1 and cottage number 2 are located next to each other

ANNEXURE D

QUESTION 5.1

TABLE 3: NUMBER OF LEARNERS, TEACHERS AND SCHOOLS, AND LEARNER-TEACHER RATIO (LTR), LEARNER-SCHOOL RATIO (LSR) AND TEACHER-SCHOOL RATIO (TSR) IN PUBLIC SCHOOLS AND INDEPENDENT SCHOOLS, BY PROVINCE, DURING 2013

PROVINCE	NUMBER OF LEARNERS	NUMBER OF TEACHERS	NUMBER OF SCHOOLS	RATIOS		
				LTR	LSR	TSR
Eastern Cape	1 938 078	66 007	5 733	29,4	338	11,5
Free State	664 508	24 475	1 396	27,2	476	17,5
Gauteng	2 129 526	74 823	2 649	28,5		28,2
KwaZulu-Natal	2 866 570	96 057	6 156	29,8	466	15,6
Limpopo	1 714 832	57 108	4 067	30,0	422	14,0
Mpumalanga	1 052 807	34 936	1 885	30,1	559	18,5
Northern Cape	282 631	8 972	573	31,5	493	15,7
North West	788 261	26 194	1 606	30,1	491	16,3
Western Cape	1 052 435	36 451	1 655	28,9	636	22,0
Totals	12 489 648		25 720	29,4	486	16,5

[Adapted from Snap Survey 2013]