



education

Department:
Education
REPUBLIC OF SOUTH AFRICA

**NATIONAL
SENIOR CERTIFICATE**

GRADE 11

MATHEMATICAL LITERACY P1

NOVEMBER 2007

MARKS: 100

TIME: 2½ hours

This question paper consists of 11 pages and 4 annexures.

INSTRUCTIONS AND INFORMATION

1. This question paper consists of FIVE questions. Answer ALL the questions.
2. QUESTIONS 2.1.2 (b), 2.2.2 and 3.6 must be answered on the attached annexures. Write your name/examination number in the space provided on the attached annexures and hand in them in with your answer book.
3. Number the questions correctly according to the numbering system used in this question paper.
4. An approved calculator (non-programmable and non-graphical) may be used, unless stated otherwise.
5. ALL the calculations must be clearly shown.
6. ALL the final answers must be rounded off to TWO decimal places, unless stated otherwise.
7. Start each question on a NEW page.
8. Write neatly and legibly.

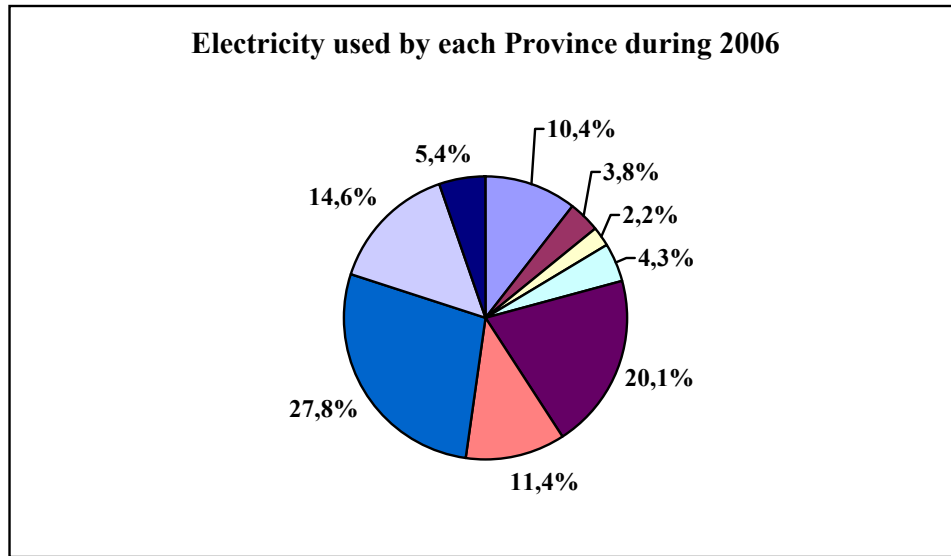
QUESTION 1

Statistics South Africa published the following information on their website:

Electricity used by each Province during 2006 (In gigawatt hours (GWh))								
Western Cape	Eastern Cape	Northern Cape	Free State	KwaZulu-Natal	North West	Gauteng	Mpumalanga	Limpopo
22 380	8 260	4 730	9 140	43 170	24 420	59 730	31 390	11 520

[Reference: StatsSA: Electricity generated and available for distribution (March 2007)]

A pie chart to illustrate this information is shown below:



- 1.1 Write the amount of electricity used by Limpopo rounded off to the nearest thousand. (1)
- 1.2 1.2.1 Which province used the most electricity during 2006? (1)
- 1.2.2 What percentage of the electricity did this province use? (1)
- 1.3 Which province used 2,2% of the electricity in 2006? (2)
- 1.4 Calculate the total number of gigawatt hours of electricity used through the whole of South Africa in 2006. (2)
- 1.5 What was the difference in the number of gigawatt hours (GWh) used by Western Cape and the Free State? (2)

- 1.6 Water is a scarce resource in South Africa, and we are currently suffering from a shortage of electricity as well. As concerned citizens we should be considering ways in which we can conserve both water and electricity.

The following table shows the amount of water and electricity used for a hot bath and a hot shower:

Usage	Amount of water used in litres	Cost of hot water in cents
Standard bath (depth of 12 cm)	70	96
Shower (hot water running for 5 minutes)	50	48

- 1.6.1 How much water do you use in a shower lasting 10 minutes? (2)
- 1.6.2 What is the cost of hot water for a bath if the depth of water is 36 cm? (2)
- 1.6.3 What is the weekly cost of the hot water if you had a 5 minute hot shower every day of the week? (2)
- 1.6.4 Express the cost of a shower as a fraction of the cost of a bath. Write the fraction in simplest form. (2)

[17]

QUESTION 2

The local child welfare organisation is planning a fund-raising dinner-dance and intends selling 200 tickets at R150,00 each.

The organisers have to choose between the Impala Conference Centre and the community hall as a venue.

A musical group has agreed to provide the music for free.

2.1 The organisers compare the costs of the two venues:

2.1.1 The Impala Conference Centre has no basic fee, but charges R120 per person.

Calculate the value of A using the information given in TABLE I. Show ALL your calculations.

Number of tickets sold (n)	0	50	100	160	200
Cost (C) in rand	0	6 000	12 000	A	24 000

(2)

2.1.2 The community hall charges a basic fee of R3 000 and then charges R90 per person.

Number of tickets sold (n)	0	50	100	B	200
Cost (C) in rand	3 000	7 500	12 000	15 600	21 000

The formula that expresses the cost (C) of hiring the community hall in terms of the number (n) of tickets sold is:

$$C = R90 \times n + R3\ 000$$

(a) Use the formula to calculate the value of B. Show ALL your calculations.

(3)

(b) Use TABLE II to draw a straight line graph on the grid provided on the annexure (ANNEXURE A). Clearly label this graph as *Cost*.

(6)

2.1.3 Use the values in TABLE I and TABLE II to write down the number of tickets sold when the cost for the two venues is the same.

(1)

2.1.4 Suppose all the tickets are sold. Use TABLE I and TABLE II to write down the ratio of the cost for 200 people of hiring the Impala Conference Centre to the cost of hiring the community hall.

(2)

- 2.2 The tickets are sold at R150 each. The formula that expresses the total income (I) in terms of the number (n) of tickets sold is $I = 150 \times n$.

TABLE III shows the number of tickets sold and the income received.

Number of tickets sold (n)	0	50	100	150	200
Income (I) in rand	0	7 500	15 000	C	30 000

- 2.2.1 Use the formula to calculate the value of C. Show ALL your calculations. (2)
- 2.2.2 Use the values in TABLE III to draw a straight line graph on the grid provided on the attached annexure (ANNEXURE A). Clearly label the graph as *Income*. (5)
- 2.3 The organisers eventually decided to use the community hall for their function. Use the values in TABLE II and TABLE III (which are repeated on ANNEXURE B) to answer the following:
- 2.3.1 Determine the number of tickets which must be sold for the organisation to make neither a profit nor a loss (break even). (1)
- 2.3.2 What profit did the organisers make from selling 200 tickets, if
Profit = Income – Costs? (2)
- 2.4 The musical group has 13 members who are all female. Three members play the violin, two members the trumpet, one member the drums and the rest all play the guitar.
- What is the probability that a member, chosen randomly:
- (a) Plays the violin (2)
- (b) Plays the keyboard (2)
- (c) Is female (2)

[30]

QUESTION 3

Betty's Caterers provides a catering and hiring service for functions. She employs 16 casual workers as waiters, and hires out tables, table cloths and chairs.

The casual workers are paid according to the number of hours worked. Their weekly wages in December, when there were many functions, were as follows:

DECEMBER 2006 WEEKLY WAGES

R396	R425	R464	R464	R515	R535	R535	R535
R535	R535	R535	R560	R578	R578	R831	R1 025

Their weekly wages in January, when there were not many functions, were as follows:

JANUARY 2007 WEEKLY WAGES

R296	R325	R414	R424	R425	R425	R435	R475
R485	R490	R535	R550	R565	R578	R631	R925

- 3.1 What was the median weekly wage in January? (3)
- 3.2 What was the range of weekly wages in January? (2)
- 3.3 The mean weekly wage in December was R565,38.
- (a) How many casual workers earned more than the mean weekly wage in December? (1)
- (b) Calculate the percentage of the casual workers who earned a weekly wage in December that was greater than the mean weekly wage. (2)
- 3.4 Calculate the mean weekly wage in January. (3)
- 3.5 On 15 May 2007, labour minister Membathisi Mdladlana, announced that all waiters are to be paid a minimum wage of R1 380 per month.
- 3.5.1 How much is this per week? (1)
- 3.5.2 How many of the waiters earned less than this minimum wage in January? (1)

- 3.6 Betty wanted to draw a graph to compare the wages in December and January. She used two frequency tables to organise the data.

WEEKLY WAGES IN DECEMBER (in rand)	
Intervals	Frequency
200 – 299	0
300 – 399	1
400 – 499	3
500 – 599	10
600 – 699	0
700 – 799	0
800 – 899	1
900 – 999	0
1 000 – 1 099	1
TOTAL	16

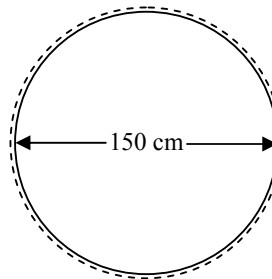
WEEKLY WAGES IN JANUARY (in rand)	
Intervals	Frequency
200 – 299	1
300 – 399	1
400 – 499	8
500 – 599	4
600 – 699	1
700 – 799	0
800 – 899	0
900 – 999	1
1 000 – 1 099	0
TOTAL	16

She decided to represent the information as a compound bar graph. The bar graph showing the weekly wages in December is already provided on the attached ANNEXURE B. On the same grid, complete the graph by drawing in bars to show the weekly wages in January.

(6)

- 3.7 Betty bought round tables having a diameter (D) of 130 cm.

- 3.7.1 She made table cloths with a diameter of 150 cm for these tables. She decided to sew lace around the edge of the table cloths. What length of lace is needed for each table cloth? (Use: Circumference (C) = πD , using π as 3,14.)



(2)

- 3.7.2 A maximum of 8 people can sit around each table.

- (a) If she has 20 tables, how many chairs will she need? (1)
 (b) How many tables would she need for 106 people? (2)

[24]

QUESTION 4

Mrs Dunn is the mother of twins Paul and Pauline. She is very health conscious, so she regularly serves fruit salad and low fat ice cream for dessert.

4.1 The till slip below shows the ingredients she purchased for her dessert.

SHOPRITE NEWLANDS			
P.O.BOX 11 700, MARINE PARADE			
DURBAN 4056			
Tax Invoice			
VAT REGISTRATION NO: 442010677			
GOVERNMENT PLASTIC BAG 24 ℓ			R0,21
GOVERNMENT PLASTIC BAG 24 ℓ			R0,21
PINEAPPLE			R3,99 *
BANANAS 6'S			R5,44 *
PEAR PER KG			R1,46 *
ICE CREAM 2 ℓ			R26,99
GRENADILLA 110 g			R5,99
APPLES			R5,42 *
PEACH SLICES			R5,69
MANGO 1'S			R1,99 *
MANGO 1'S			R1,99 *
LEMONS PER kg			R2,30 *
MANGO 1'S			R1,99 *
13 BALANCE DUE			R63,67
	Cash Rounding		- R0,02
	Cash		R100,00
	CHANGE		R36,35
Rate	VAT		TOTAL
14,00%	4,80		39,09
* 0,00%	0,00		24,58
VAT NO. 442010677			
CASHIER NAME:	NTANDO GUMEDE		
C0012 #0218	15:33:42	16MAY2007	
	S00351	R009	
KEEP TILL SLIP AS PROOF OF PURCHASE			
	TEL 031-5747000		

4.1.1 Use the till slip to answer the following questions:

- (a) Was this purchase made in the morning, afternoon or evening? (1)
- (b) How many mangoes were purchased? (1)
- (c) What is the percentage of the Value-Added Tax (VAT) paid? (1)
- (d) How many items on the till slip were VAT free items? (1)
- (e) How much VAT was paid? (1)

4.1.2 Write down the ratio of the size of the plastic bag to the size of the ice-cream container. Give the answer in simplified form. (2)

4.1.3 What is the cost per litre of ice cream? (1)

4.1.4 The ice cream container is rectangular in shape and has a volume of 2 ℓ, where 2 ℓ = 2 000 cm³. If the length of the ice cream container is 25 cm and the width is 10 cm, calculate the height of the container. (Use the formula **volume = length x breadth x height**, or $V = l \times b \times h$) (3)

- 4.2 The twins' mother is very health conscious and annually calculates their Body Mass Index. This is an indication of the amount of fat in the body.

Aunty Miranda came to visit the family on the twins' 14th birthday. In the country where she stays, mass is measured in pounds and lengths are measured in inches.

Aunty Miranda decided to record Pauline's height and mass using her measuring instruments, while their mother recorded Paul's height and mass.

The following data were recorded.

Twin	Mass	Height
Paul	56 kg	1,65 m
Pauline	99 pounds	60 inches

- 4.2.1 Use the conversion table on ANNEXURE C to calculate:

- (a) Pauline's height in metres, correct to 3 decimal places (2)
 (b) Paul's mass in pounds, correct to 2 decimal places (2)

- 4.2.2 Use the formula: **Body Mass Index (BMI)** = $\frac{\text{mass in } kg}{(\text{height in } m)^2}$
 to calculate Paul's BMI (body mass index), correct to 1 decimal place. (3)

[18]

QUESTION 5

Carlos Hernandez is a Colombian medical student on an exchange programme to South Africa. He is based at the Polokwane Hospital, but will also spend time at the Pietersburg Medi-Clinic.

Use the map of the centre of Polokwane in Limpopo on the attached ANNEXURE D to answer the following questions:

- 5.1 Pietersburg Comprehensive (Pietersburg Comp.) is in grid B3. What is the grid reference for the Polokwane Hospital? (2)
- 5.2 Thabo Mbeki Street is a one-way street going from east to west. What other street shown on this map is a one-way street going from east to west? (1)
- 5.3 The Pietersburg Medi-Clinic takes up a whole block. Write down the names of the streets around the Medi-Clinic. (2)
- 5.4 Give directions to Carlos as to how to get from Polokwane Hospital, which has its entrance in Hospital Street, to the Pietersburg Medi-Clinic, which has its entrance in Burger Street. (2)
- 5.5 The distance on the map between the Polokwane Hospital and the Pietersburg Medi-Clinic is 90 mm. The scale is 1:22 500. Use the scale to give Carlos this distance in kilometres. (2)
- 5.6 Carlos gets an allowance of 200 000 Colombian pesos per month. What is this in rand?

EXCHANGE RATE
1 000 Colombian peso = 2,59 South African rand
1 South African rand = 385,99 Colombian pesos

(2)

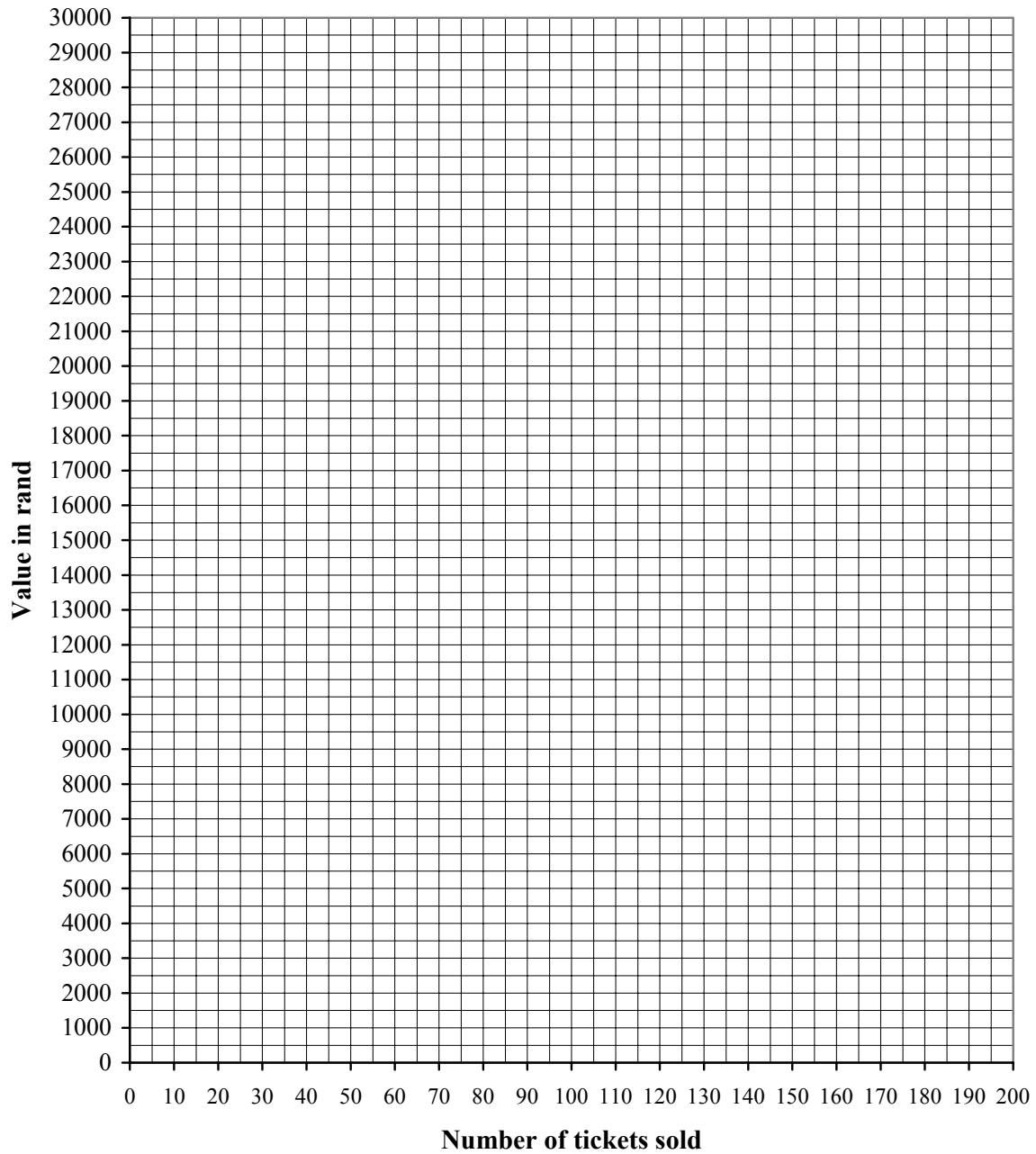
[11]**TOTAL: 100**

NAME/EXAMINATION NUMBER:

ANNEXURE A

QUESTIONS 2.1.2 (b) and 2.2.2

Income and Expenses



NAME/EXAMINATION NUMBER:

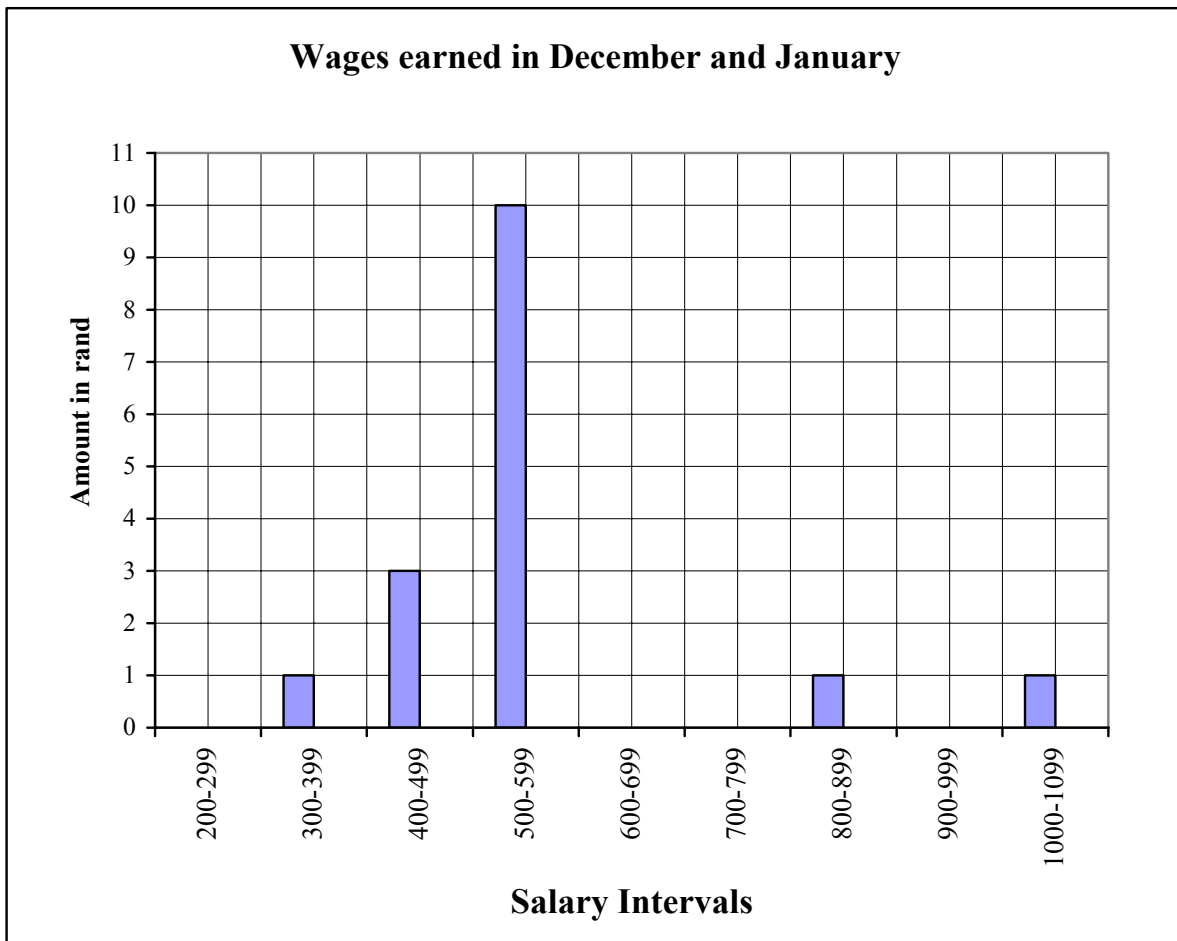
ANNEXURE B

QUESTION 2.3

Number of tickets sold (n)	0	50	100	B	200
Cost (C) in rand	3 000	7 500	12 000	15 600	20 400

Number of tickets sold (n)	0	50	100	150	200
Income (I) in rand	0	7 500	15 000	C	30 000

QUESTION 3.6



NAME/EXAMINATION NUMBER:

ANNEXURE C

QUESTION 4.2.1

CONVERSION TABLE

1 ounce = 28,35 grams

1 gram = 0,0352 ounces

1 pound = 0,4536 kilograms

1 kilogram = 2,2045 pounds

1 inch = 0,0254 metres

1 centimetre = 0,3937 inches

1 foot = 0,3048 metres

1 metre = 3,2808 feet

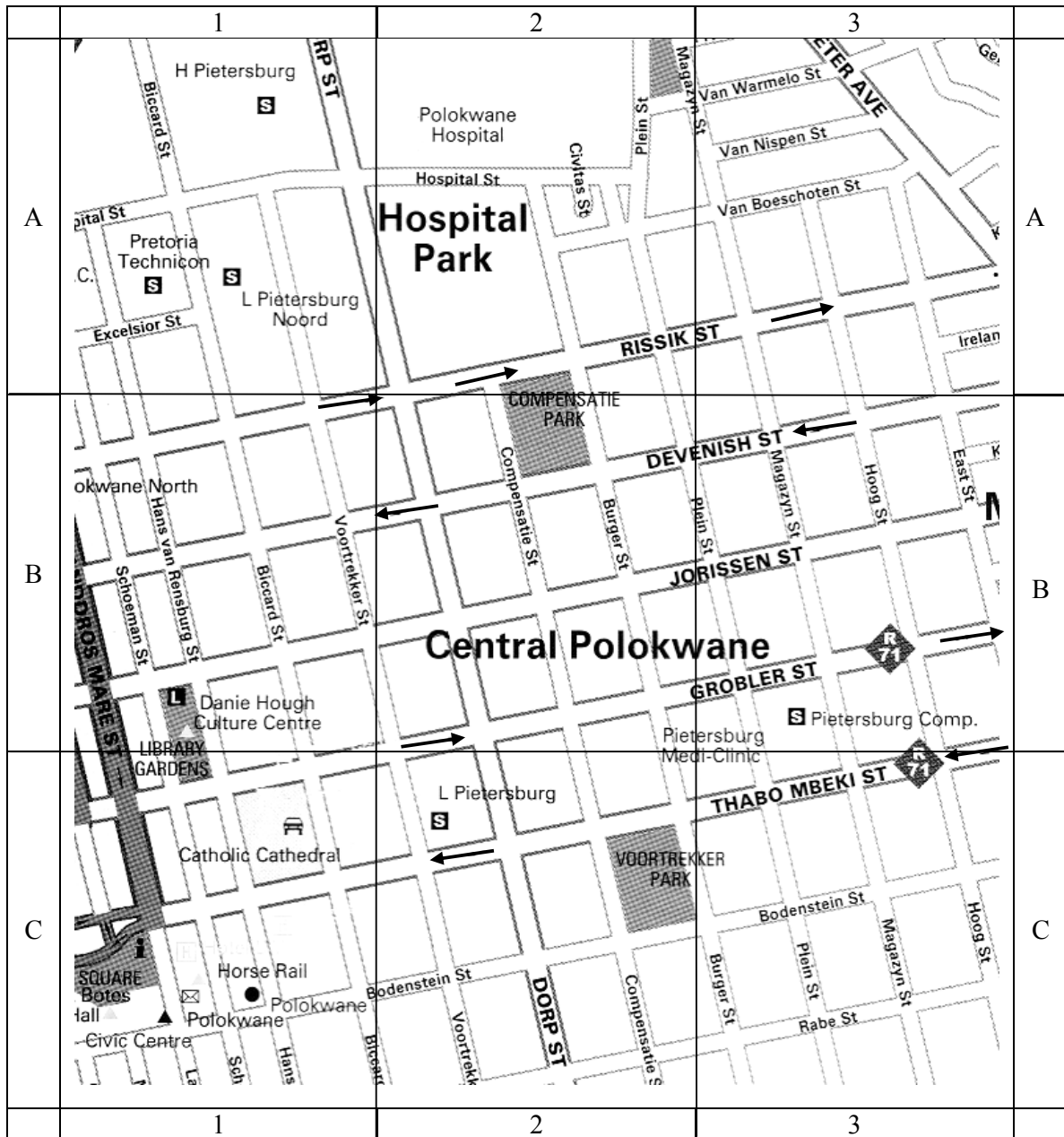
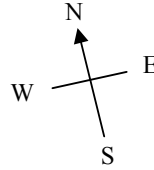
1 yard = 0,9144 metres

1 metre = 1,0936 yards

NAME/EXAMINATION NUMBER:

ANNEXURE D

QUESTION 5



MapStudio ROAD ATLAS – SOUTH AFRICA. 19th edition