



education

Department:
Education
REPUBLIC OF SOUTH AFRICA

**NATIONAL
SENIOR CERTIFICATE**

GRADE 11

MATHEMATICAL LITERACY P2

EXEMPLAR 2007

MARKS: 100

TIME: 2½ hours

This question paper consists of 12 pages and 3 diagram sheets.

INSTRUCTIONS AND INFORMATION

1. This paper consists of FOUR questions. Answer ALL the questions.
2. QUESTION 3.5 has to be answered on the attached diagram sheet. Write your name/examination number in the space provided and hand in the diagram sheet with your ANSWER BOOK.
3. Number the answers 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 shown clearly.
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.

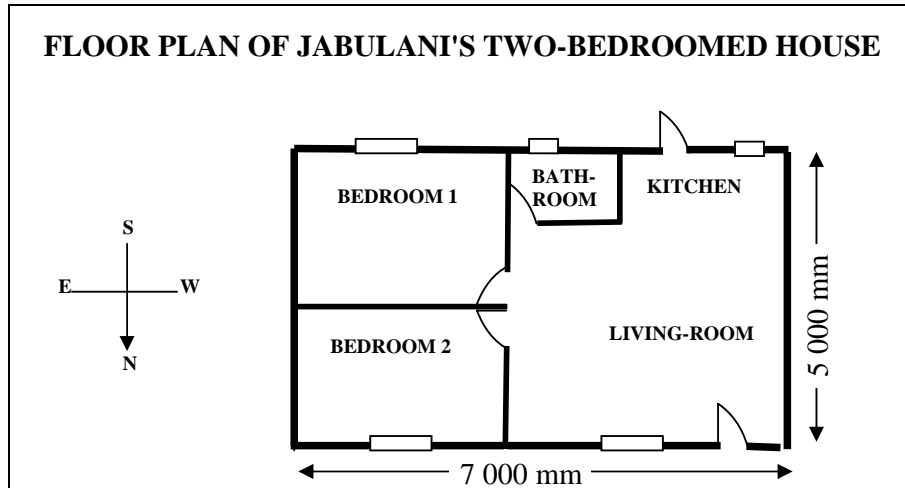
QUESTION 1

Jabulani and his family have lived with his parents for many years. He has now saved enough money and wants to have a house built for himself and his family. He consults a draughtsman to draw plans for the house.

A sketch and a floor plan of the house are shown below. The floor plan is also on the attached diagram sheet.



A sketch of Jabulani's house.



- 1.1 Jabulani employs Simelane Contractors to do the building of his house. Jabulani and the contractors agree that the foundations of the house will be made out of a solid rectangular concrete slab.

Concrete is made from cement, sand and crushed stone which are mixed with water. The following table gives the ratio of cement, sand and stone to use when mixing the concrete.

Number of bags of cement	Number of wheelbarrows of sand	Number of wheelbarrows of crushed stone	Volume of the concrete in m ³
1	2	4	0,2
2	4	8	0,4

- 1.1.1 If the contractors need 5 m³ of concrete, how many bags of cement must they use? (3)

1.1.2 In order to calculate the amount of concrete needed for the concrete slab, the contractors work out the total area of the slab. They use the area of the slab together with the thickness of the slab to calculate the volume of the concrete slab.

(a) Calculate the total floor area of the house. (2)

(b) If the concrete floor slab is 0,3 m thick, calculate the volume of concrete used for the floor slab.

Use the formula:

Volume of rectangular prism = area of base x height (2)

1.2 The contractors ordered bricks for the walls of the house. They know that bricks usually get damaged during transportation. To make an allowance for this, an extra 5% is ordered.

Calculate the number of bricks that should be ordered, if 10 000 bricks are needed. (3)

1.3 Jabulani decides that he wants the outside of his house painted white. He uses the plan to calculate the area of the outside walls and then calculates how much paint he will need.

Study the floor plan of the house.

- The east and west walls have no windows
- The north wall contains 2 large windows and a door
- The south wall contains 1 large window, 2 small windows and a door

DIMENSIONS NOT GIVEN ON THE FLOOR PLAN

The height of the walls is 3 m

The doors are 82 cm wide and 210 cm high

The large windows are 240 cm wide and 150 cm high

The small windows are 120 cm wide and 80 cm high

1.3.1 Calculate the following in square metres (m²):

(a) The total area of the two doors (2)

(b) The total area of the five windows (5)

(c) The total area of the outside walls that has to be painted. (7)

1.3.2 If one litre of paint is needed to paint one coat of paint on 3 m² of the wall, calculate how many litres of white paint are required to paint two coats of paint on the outside of the house. (3)

- 1.3.3 White paint is sold in 1 litre, 5 litre, 10 litre and 20 litre tins. The paint is advertised as follows:



What size tin of paint would be the cheapest option to buy to paint the outside of the house?

Show ALL your calculations for determining the answer.

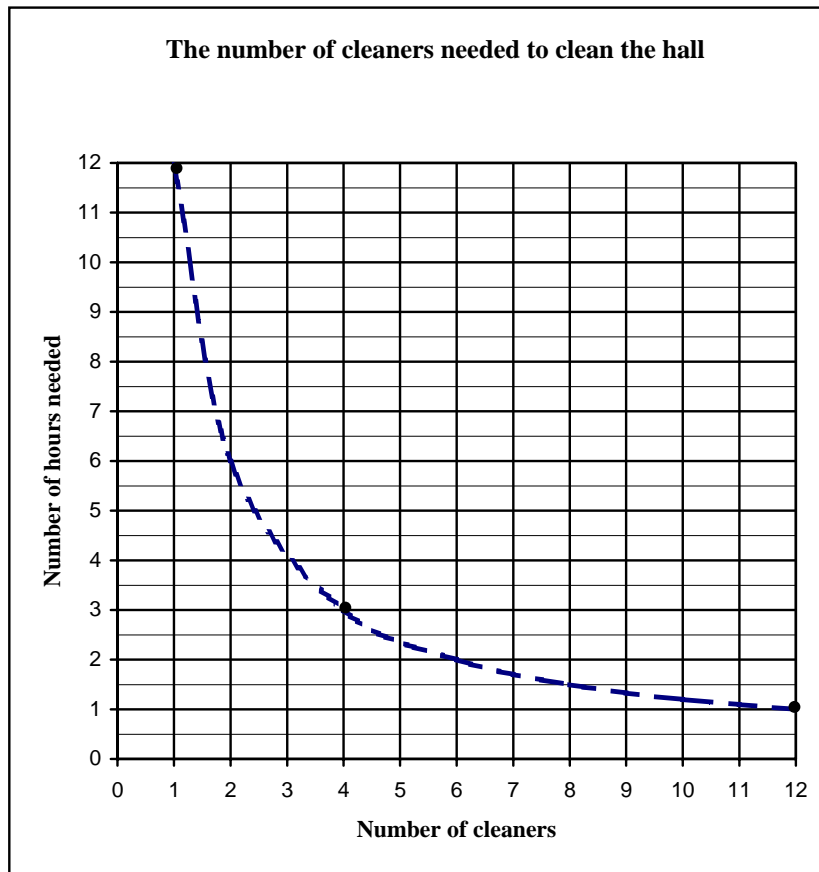
(3)
[30]

QUESTION 2

2.1 SUPERCLEAN is a company which runs a cleaning service. They are hired to clean a banquet hall. The number of employees sent to clean the hall is dependent on the time between functions. If there is more than one function on a particular day, the hall may need to be cleaned in 1 hour. The table below shows the number of cleaners and the number of hours it takes to clean the hall.

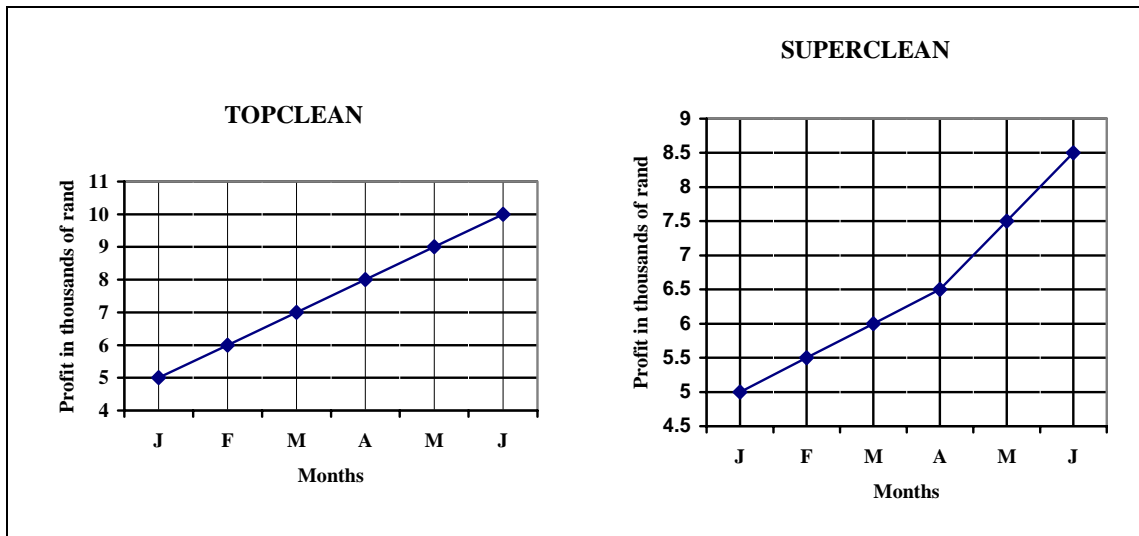
Number of cleaners	1	2	4	E	12
Number of hours needed to clean the hall	12	D	3	2	1

- 2.1.1 Calculate the value of D and E using the information given in the table. (4)
- 2.1.2 The graph below illustrates the above-mentioned information.



- (a) Explain why the graph is represented as a dotted line. (2)
- (b) Use the graph to determine approximately how long it would take five cleaners to clean the hall. (2)
- (c) How many hours would it take 24 cleaners to clean the hall? (2)
- (d) What type of proportion does this graph represent? (1)

2.2 John and Andile are the managing directors of TOPCLEAN and SUPERCLEAN respectively. The two are constantly arguing about which one of the two companies yields a higher profit. The graphs below show the profits of the two companies.



Use the graphs to answer the following questions:

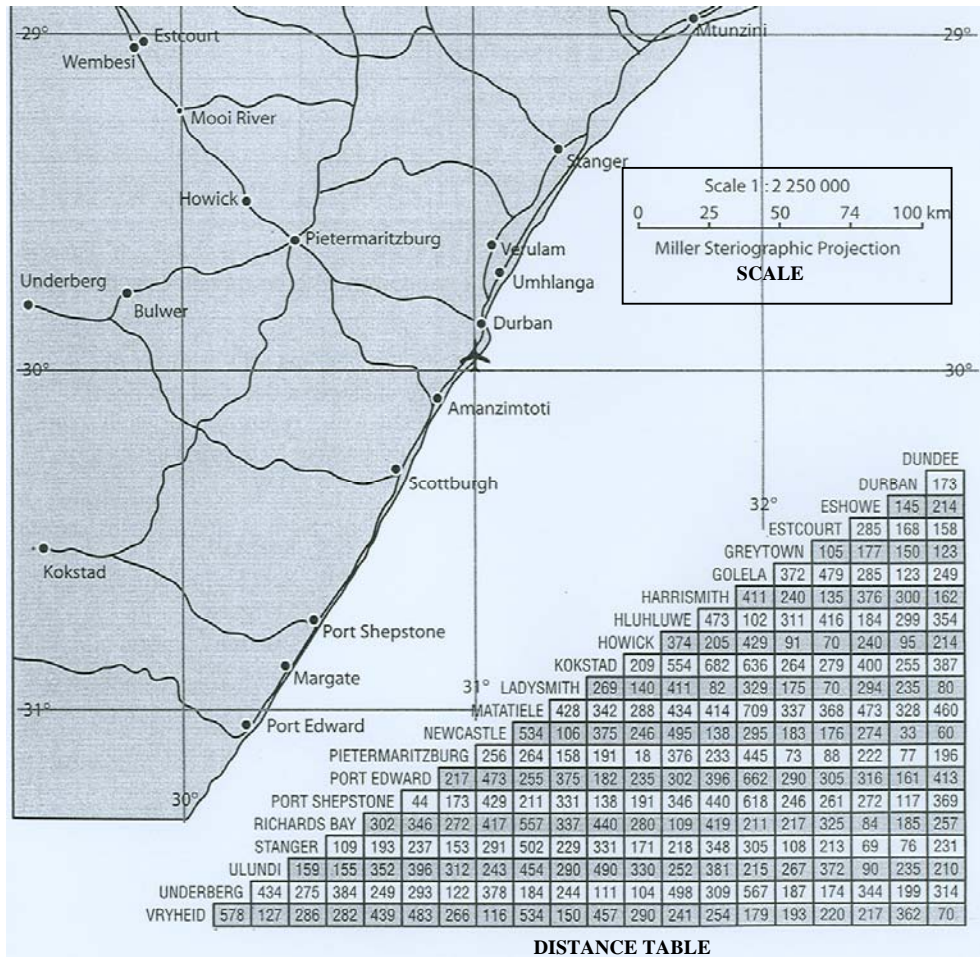
- 2.2.1 Which company appears to be earning a higher profit?
Give a reason for your answer. (2)
- 2.2.2 John says that the graphs are misleading. Andile says that they are not misleading.
 - (a) Calculate the difference in profit for SUPERCLEAN between January and April. (2)
 - (b) Calculate the difference in profit for TOPCLEAN between January and April. (2)
 - (c) Which managing director is correct? Give a reason for your answer. (1)
 - (d) How would you change the graphs to support your argument? (2)
- 2.2.3 Calculate the total profit made by TOPCLEAN from January to June. (2)

[22]

QUESTION 3

Fatima runs a transport company in Durban. Her company has six large trucks which transport goods throughout KwaZulu-Natal.

The diagram below shows a map of a part of KwaZulu-Natal as well as a distance table. Fatima calculates the distance between towns using the map or the distance table.



Reference: www.mapofkzn.co.za

- 3.1 One of the routes often travelled by her trucks is the route from Durban to Howick.
 - 3.1.1 Use the scale, the map and a ruler to work out the shortest distance in kilometres from Durban to Howick. (3)
 - 3.1.2 Use the distance table to read off the distance between Durban and Howick. Compare the two distances. If they are different, give a reason for the difference. (2)

3.2 The company is hired to transport a load from Durban to Kokstad. The two common routes are from Durban to Kokstad via Port Shepstone or from Durban to Kokstad via Pietermaritzburg. Use the distance table to determine the following:

- 3.2.1 The distance from Durban to Kokstad via Pietermaritzburg (2)
- 3.2.2 The distance from Durban to Kokstad via Port Shepstone (2)
- 3.2.3 Which route is indicated on the distance table as the distance between Durban and Kokstad? (1)

3.3 The following table lists the income and expenses for Fatima's Transport Company for January 2006. Running costs include rental for the business premises, telephone, electricity and water.

INCOME		EXPENSES	
Payment received from customers	R682 500,00	Running costs	R325 400,00
		Salaries	R100 000,00
		Petrol	R50 000,00

- 3.3.1 Calculate the profit made by the transport company for January. (3)
- 3.3.2 The profit of the company for February was 10,5% more than the profit for January.
 - (a) If the expenses of the transport company for February were unchanged, determine the income for February. (5)
 - (b) Calculate the profit margin for February. (3)

Use the formula:
$$\text{Profit Margin} = \frac{\text{Income} - \text{Expenses}}{\text{Expenses}} \times 100\%$$

3.4 The rate to transport goods from Durban to Howick is R1 500 per load.

- 3.4.1 Write down the equation that expresses the income (I) in terms of the number of loads as follows:

$$I = n \times \dots\dots\dots$$
 (where n = number of loads) (1)

- 3.4.2 The following formula is used to calculate the expenses (E) for the cost per load between Durban and Howick:
 Expenses(E) = Cost of diesel \times number of loads + maintenance and salary
 Or $E = 750 \times n + 3\,500$

The table below represents the income and expenses for transporting different numbers of loads between Durban and Howick.

Number of loads per month	0	1	2	3	4	5	6
Expenses (E)	R3 500	R4 250	R5 000	R5 750	R6 500	R7 250	R8 000
Income (I)	0	R1 500	R3 000	R4 500	R6 000	R7 500	R9 000

Use the table to draw TWO line graphs on the set of axes provided on the diagram sheet. Clearly label each line graph. (5)

3.4.3 Use the graphs to answer the following questions:

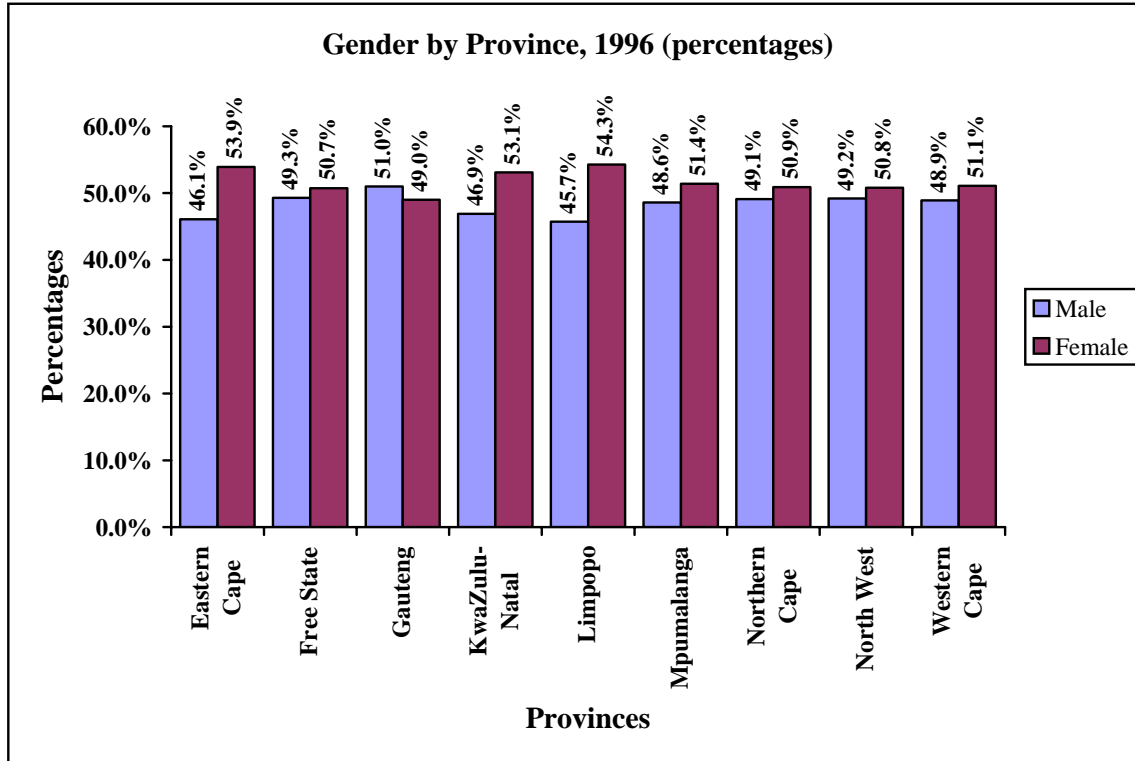
(a) What is the approximate amount in rand at the break-even point? (1)

(b) Determine the profit made if the company transports SIX loads between Durban and Howick. (2)

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QUESTION 4

An official census is the official periodical collection of information about the size and characteristics of the population of a country. The 1996 Census in South Africa collected information about the number of males and females in each province in our country. The information illustrated in the diagram and table below was published by Statistics South Africa.



Population of South Africa by Province, 1996	
Eastern Cape	6 302 525
Free State	2 633 504
Gauteng	7 348 423
KwaZulu-Natal	8 417 021
Limpopo	4 929 368
Mpumalanga	2 800 711
Northern Cape	840 321
North West	3 354 825
Western Cape	3 956 875
TOTAL	40 583 573

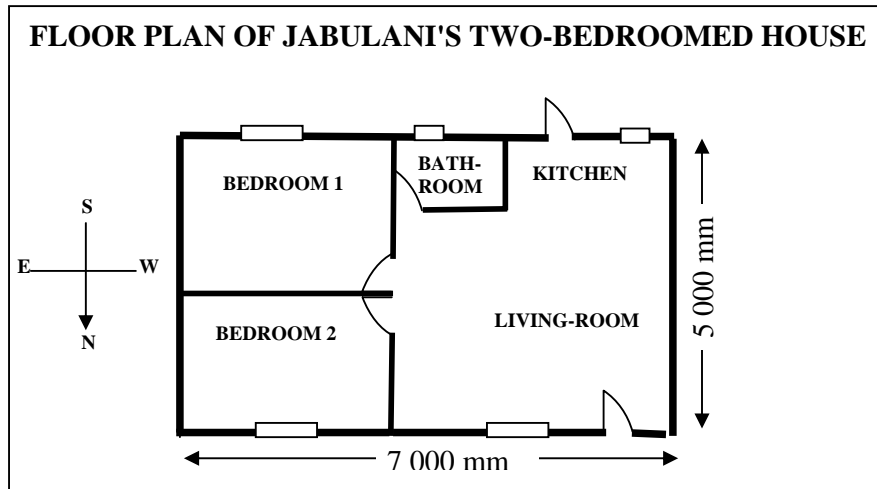
- 4.1 In which province was the percentage of males greater than the percentage of females? (2)
- 4.2 In which province is there the greatest difference between the percentages of males and females? (4)
- 4.3 Calculate the difference in the number of males in Gauteng compared to the number of males in KwaZulu-Natal. (5)

- 4.4 What percentage of the total population of South Africa are males who live in the Northern Cape? (3)
- 4.5 A person from the database of this census is chosen at random to represent South Africa as an ambassador at the 2007 Cricket World Cup final.
- 4.5.1 What is the probability that the person chosen is from Mpumalanga? (2)
- 4.5.2 What is the probability that the person chosen is NOT from the Western Cape? (2)
- [18]**
- TOTAL: 100**

NAME/EXAMINATION NUMBER:

DIAGRAM SHEET 1

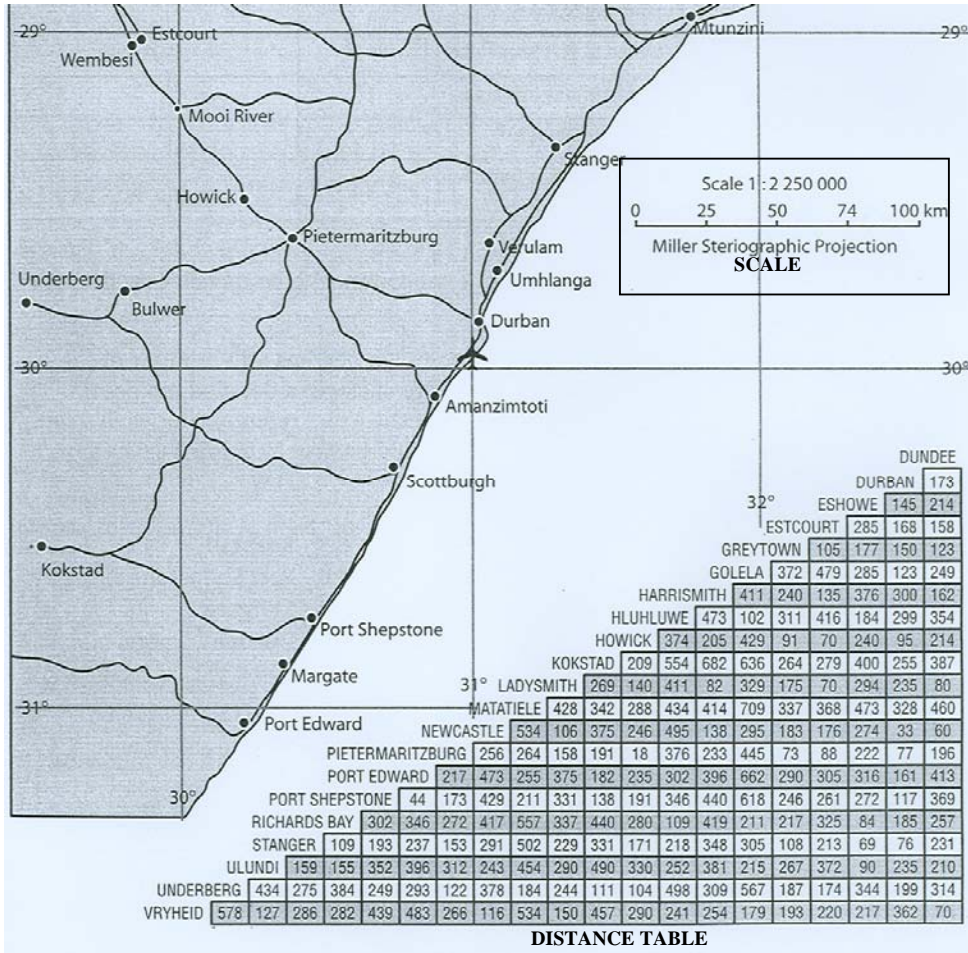
QUESTION 1



NAME/EXAMINATION NUMBER:

DIAGRAM SHEET 2

QUESTION 3.1



NAME/EXAMINATION NUMBER:

DIAGRAM SHEET 3

QUESTION 3.5

