



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

MATHEMATICAL LITERACY P1

EXEMPLAR 2014

MARKS: 150

TIME: 3 hours

This question paper consists of 13 pages and 4 annexures.

INSTRUCTIONS AND INFORMATION

1. This question paper consists of FIVE questions. Answer ALL the questions.
2. Answer QUESTION 1.2.2(b) on ANNEXURE A and QUESTION 3.1.5 on ANNEXURE B. Write your name and grade/class in the spaces on these ANNEXURES and hand in the ANNEXURES with your ANSWER BOOK.
3. Use ANNEXURE C to answer QUESTION 4.2 and ANNEXURE D to answer QUESTION 5.1.4.
4. Number the answers correctly according to the numbering system used in this question paper.
5. Start EACH question on a NEW page.
6. You may use an approved calculator (non-programmable and non-graphical), unless stated otherwise.
7. Show ALL the calculations clearly.
8. Round off ALL the final answers to TWO decimal places, unless stated otherwise.
9. Indicate units of measurement, where applicable.
10. Maps and diagrams are NOT necessarily drawn to scale, unless stated otherwise.
11. Write neatly and legibly.

QUESTION 1

1.1

Pantsula is a dance company. The company has a bank account with Siyonga Bank. The bank statement dates run from the 15th of the month to the 14th of the next month. Below is part of Pantsula's Bank Statement for a certain period in 2013.

DETAILS	DEBITS	CREDITS	DATE	BALANCE
Balance brought forward			19/04	28 955,47
Bank Statement			20/04	28 955,47
Cash deposit		2 239,10	21/04	31 194,57
Cheque 696	850,00		23/04	A
Stop order from NGK		3 100,00	25/04	33 444,57
Cash deposit		110,00	29/04	33 554,57
Service fee	44,20		01/05	33 510,37
Monthly account fee	55,00		01/05	33 455,37
Transaction charge	33,00		01/05	33 422,37
Cash deposit fee	116,26		01/05	33 306,11
Administration charge	8,00		01/05	33 298,11
Cash deposit		500,00	02/05	33 798,11
Cheque 697	B		02/05	33 540,64

Service fees are reflected on the day of the transaction but deducted at the end of the month.

- 1.1.1 Write down Pantsula's bank balance on 19/04/2013. (1)
- 1.1.2 Determine the total amount deposited in Pantsula's account from 19/04 to 02/05. (2)
- 1.1.3 Calculate the missing values **A** and **B**. (4)
- 1.1.4 On 21/04 the service fee for depositing the amount of R2 239,10 was R31,74. Determine the service fee as a percentage of the deposited amount. (3)
- 1.1.5 Write down the approximate number of weeks that this part of the Bank Statement covers. (2)

1.2

Pantsula has a landline contract known as Scamtho 250, which consists of the following monthly tariff system:

- A fixed monthly fee of R299,00
- 150 minutes free per month for landline-to-landline calls
- 100 minutes free per month for landline-to-cellphone calls
- 80 cents per minute (billed per second) for all calls outside the free minutes.



1.2.1 Calculate the cost of a 90-second call made after the free minutes have been exhausted. Give your answer in rand. (3)

1.2.2 The table below shows Pantsula's variable costs for calls made.

TABLE 1: Pantsula's variable costs for calls made

Duration of calls (in minutes)	0	100	120	150	200	240	R
Costs for landline to landline (in rand)	0	0	0	0	40	Q	120
Costs for landline to cellphone (in rand)	0	0	16	P	80	112	160

(a) Calculate the missing values **P**, **Q** and **R**. (7)

(b) The graph showing the variable costs for landline-to-cellphone calls has been drawn on ANNEXURE A. Draw, on the same ANNEXURE, the graph showing the variable costs for landline-to-landline calls. (4)

(c) Determine Pantsula's total monthly costs if the owner used 200 minutes on landline-to-landline- and 140 minutes on landline-to-cellphone calls.

Use the formula:

Total monthly cost = Fixed monthly cost + Variable costs (5)

1.3

The dance company has been invited to compete in a dance competition. They need to loan R25 000,00 from a local accredited financial services provider.

- 1.3.1 The credit provider charges an upfront payment, known as an initiation fee, of R1 140,00. The loan amount is the sum of the initiation fee and the loan value.

Calculate the amount that Pantsula owes to the credit provider before the interest is added.

(2)

- 1.3.2 The credit provider charges a fixed annual interest rate of 24,60%. The simple interest is calculated on the full value owed to the credit provider.

Calculate the total interest to be charged on the total loan amount if it is paid over a period of four years.

Use the formula: $I = P \times r \times t$ where

I = interest amount

P = total amount credited

r = interest rate

t = period of loan

(3)

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QUESTION 2

2.1

Marieka owns a coffee shop. She serves a mixed berry and almond polenta cake that is baked in espresso cups at her coffee shop. She uses the recipe below to make the cake.

Mixed Berry and Almond Polenta Cake

Makes 15 espresso cups

Ingredients

6 eggs separated (keep the yolks for mayonnaise or scrambled egg)

140 g butter

140 g castor sugar

140 g ground almonds

250 g fat-free cottage cheese

75 g mixed frozen berries

25 g polenta

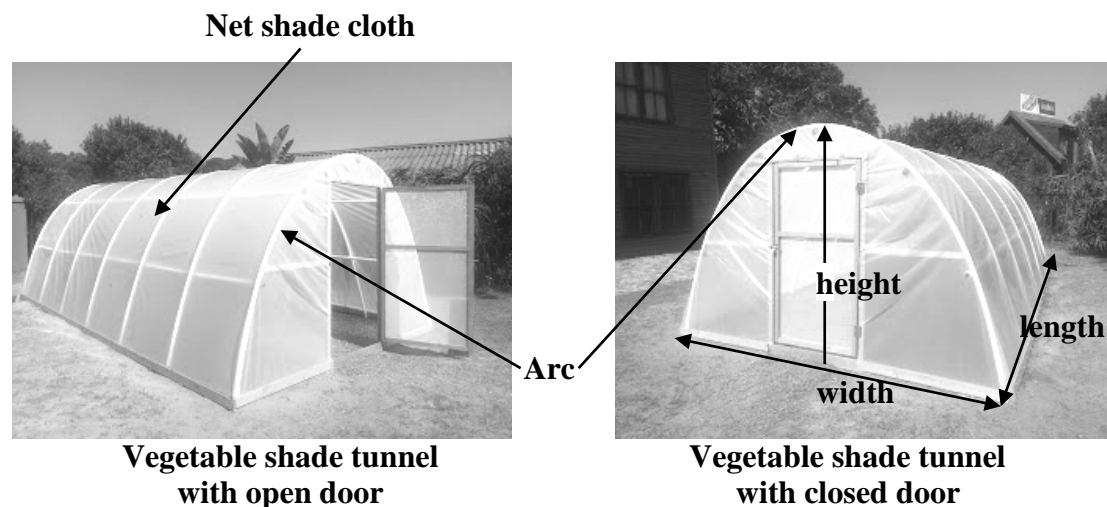
Bake at 356 °F until light brown,
30 to 40 minutes.



- 2.1.1 Express the baking temperature of 356 °F in °C.
Use the formula: $^{\circ}\text{C} = (^{\circ}\text{F} - 32^{\circ}) \div 1,8$ (2)
- 2.1.2 Fat-free cottage cheese is sold in quantities of 125 g at R8,99.
Calculate the cost of the fat-free cottage cheese required in the recipe. (2)
- 2.1.3 Give, in simplest form, the ratio of polenta : mixed frozen berries. (2)
- 2.1.4 An empty espresso cup weighs 116 g. Marieka uses an espresso cup to weigh the correct amount of castor sugar required in the recipe.
Write down the reading on the kitchen scale when the correct amount of castor sugar is placed in the espresso cup. (2)
- 2.1.5 Marieka places the cakes in the oven at 14:40. She takes the cakes out of the oven after 35 minutes. Determine the time at which she took the cakes out of the oven. (2)
- 2.1.6 Given that 1 kg = 2,2 lb. (pounds), express the amount of ground almonds required in the recipe in pounds. (2)
- 2.1.7 How many grams of mixed frozen berries are required to make 20 espresso cups of mixed berry and almond polenta cake. (2)

2.2

Marieka is building a vegetable shade tunnel in her yard to grow the vegetables she needs for her coffee shop. The vegetable shade tunnel is shown in the photographs below.



The dimensions of the vegetable shade tunnel are as follows:

Length = 6,5 m; width = 4,4 m; maximum height = 2,2 m

The vegetable shade tunnel is exactly half of a cylinder.

2.2.1 Calculate the length of the arc of the vegetable tunnel. Give your answer correct to TWO decimal places.

Use the formula: $P = \text{Length of arc} = \pi \times r$, where $\pi = 3,142$
 $r = \text{radius}$ (3)

2.2.2 Determine the minimum amount of net shade cloth required to cover the whole tunnel by calculating the surface area of the vegetable tunnel.

The following formula may be used:

Surface area = $\pi \times r^2 + P \times \ell$, where $\pi = 3,142$
 $r = \text{radius}$
 $P = \text{length of arc}$
 $\ell = \text{length of vegetable tunnel}$ (4)

2.2.3 Determine the perimeter of the garden enclosed by the vegetable tunnel.

Use the formula: **Perimeter** = $2 \times (\text{Length} + \text{Width})$ (2)

2.2.4 Marieka wants to spread compost with a uniform thickness of 0,05 m over the enclosed garden area.

Calculate the volume of compost required.

Use the formula: **Volume** = **Length** \times **Width** \times **Height** (3)
[26]

QUESTION 3

3.1

Jan studied the different religious denominations to which people belong in South Africa. TABLE 2 below shows the information from the 2012 population profile of South Africa.

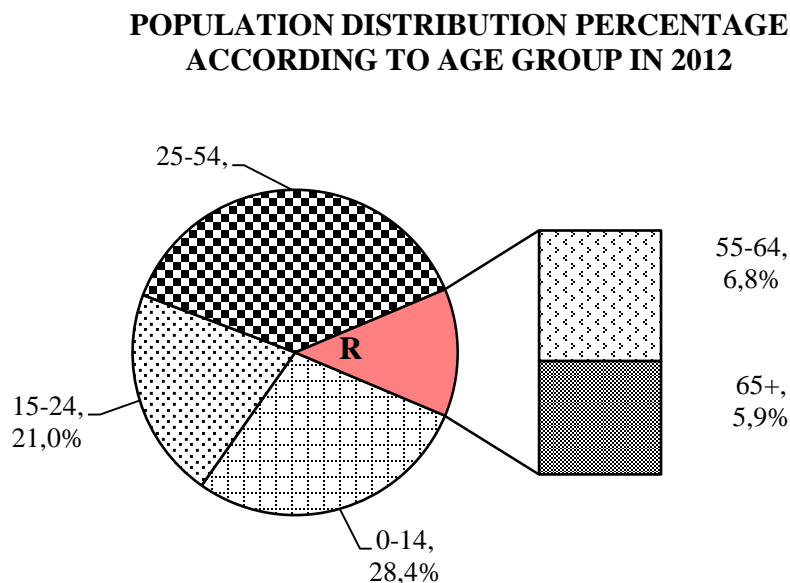
TABLE 2: Percentage of people in South Africa that belonged to religious denominations in 2012

	RELIGIOUS DENOMINATION	SYMBOL	PERCENTAGE MEMBERS
Christian	Zion Christian Church	Z	11,1
	Charismatic/Pentecostal churches	CP	8,2
	Methodist Church	MC	6,8
	Uniting/Dutch Reformed Church	UD	6,7
	Anglican Church	A	3,8
	Catholic Church	C	7,1
	Other Christian churches	OC	36
Non-Christian	Muslim	M	1,5
	Unspecified religion	U	1,4
	Other	O	2,3
	None	N	15,1

[Source: www.indexmundi.com]

- 3.1.1 Which religious denomination has the highest percentage of people that belong to it? (2)
- 3.1.2 Determine the total percentage of people that belong to Christian denominations. (2)
- 3.1.3 Determine the range of the data above. (2)
- 3.1.4 Arrange the religious denominations in ascending order of their percentage members. Use the given symbols. (2)
- 3.1.5 Use ANNEXURE B to complete the bar graph representing the percentage of people belonging to the religious denominations in TABLE 2 above. (5)
- 3.1.6 In 2012, the population of South Africa was 48 810 427.
Calculate how many people belonged to none of the religious denominations in 2012. (2)
- 3.1.7 If a person were chosen at random in South Africa, what is the probability that the person would be Catholic? (2)

- 3.2 Jan also studied the population distribution percentage according to age groups. The pie chart below shows the distribution percentage of the South African population according to age groups.



The pie chart and the accompanying bar of the pie chart above indicate the age group and the percentage of people in that age group in South Africa in 2012.

- 3.2.1 Label the sector marked **R** on the pie chart. (2)
- 3.2.2 Calculate the percentage of people in South Africa aged 25 to 54 years of age in 2012. (2)
- 3.2.3 In which age group did the majority of the people in South Africa fall in 2012? (2)
- 3.2.4 In which age group is the median age of people in South Africa likely to fall? (2)
- 3.2.5 In 2012, the growth rate of the South African population was $-0,412\%$.

Determine the population of South Africa in 2011 if the population was 48 810 427 in 2012.

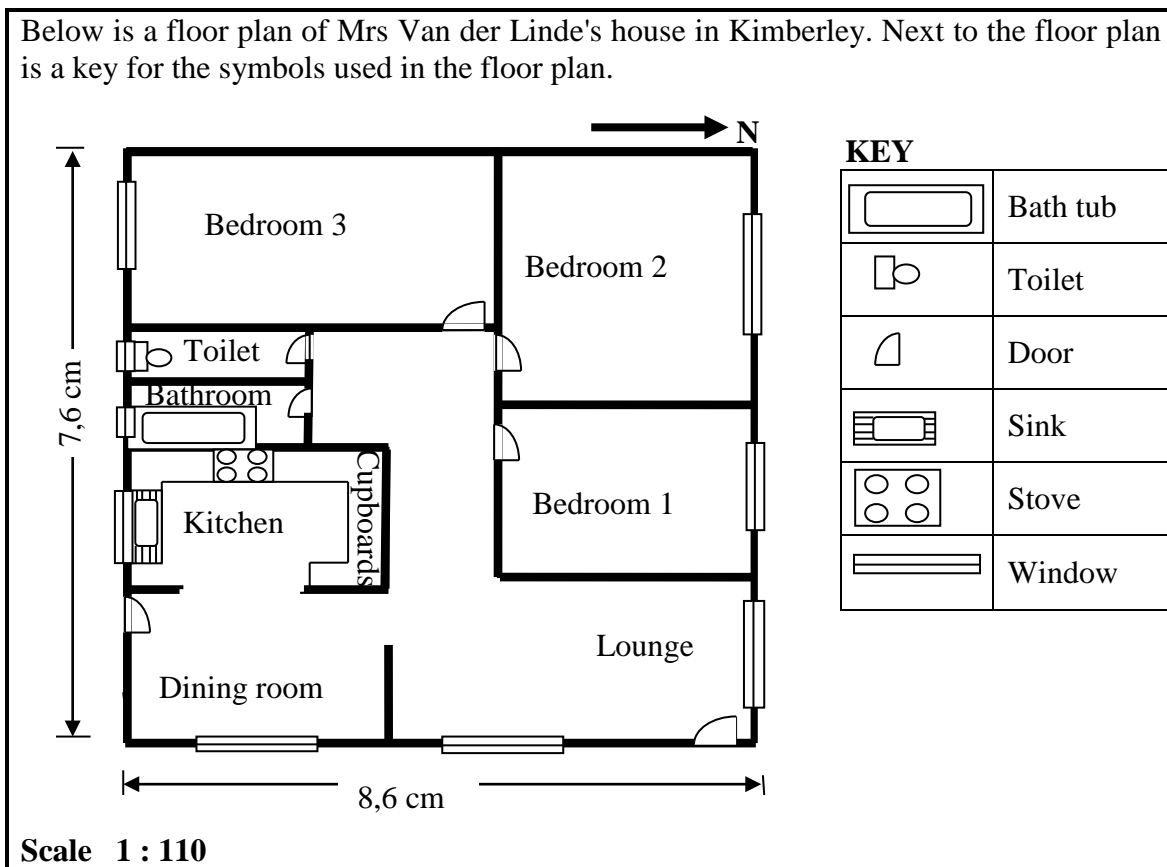
Use the formula:

$$\text{Percentage growth} = \frac{\text{Population 2012} - \text{Population 2011}}{\text{Population 2011}} \times 100\%$$

(4)
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QUESTION 4

4.1 Below is a floor plan of Mrs Van der Linde's house in Kimberley. Next to the floor plan is a key for the symbols used in the floor plan.



- 4.1.1 Use the KEY next to the floor plan to determine the number of windows shown on the plan. (2)
- 4.1.2 Write down the name(s) of the room(s) of which the door(s) is/are facing east. (3)
- 4.1.3 Explain the meaning of the scale 1 : 110 given on the floor plan. (2)
- 4.1.4 Determine the scale length of the southern wall on the floor plan. (2)
- 4.1.5 Determine the actual length (in metres) of the eastern wall using the given scale and the scale length of the wall. **Hint: 1 m = 100 cm** (3)

4.2 Use ANNEXURE C, showing part of the map of Kimberley, to answer the following:

- 4.2.1 What is the name of the road that passes over the railway line indicated on the map? (2)
- 4.2.2 Mrs Van der Linde wants to go from Kimberley New Park Centre to the cemetery.
Write down directions (use street names) that Mrs Van der Linde can use to get to the cemetery if the entrance to the cemetery is in Evans Street. (5)
- 4.2.3 Write down the name of the road that is to the south of the Big Hole. (2)

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QUESTION 5

5.1

Kevin is a 45-year-old man who works for a tourism company.

He earns a gross salary of R28 754,50 per month and a 13th cheque at the end of the company's financial year. The following are deducted from his salary on a monthly basis:

- 7,5% of his salary towards his pension
- R1 434,70 for his medical aid

5.1.1 Calculate Kevin's monthly contribution towards his pension. (3)

5.1.2 Calculate Kevin's annual medical-aid contribution. (2)

5.1.3 Kevin's taxable income for the year of assessment ending 28/02/2013 was R330 713,02.

Describe how Kevin's taxable income was calculated. (5)

5.1.4 Kevin wants to invest half of his 13th cheque (R14 377,25) for his child's education.

Bank A offers him interest of 9,5% p.a. (per annum) and Bank B offers him a compound interest of 8,5% p.a. compounded monthly.

Graphs representing the investment returns from the two options are given in ANNEXURE D.

(a) Estimate the value of the investment at Bank A at the end of 5 years. (2)

(b) After how many years will the value of the investment at Bank B be more than that at Bank A? (3)

- 5.1.5 The table below shows the tax rates for individuals for the year of assessment ending 28/02/2013.

TABLE 3: Tax rates (year of assessment ending 20/02/2013)

Tax Bracket	Taxable Income (in rand)	Rate of Tax (in rand)
A	0–160 000	18% of taxable income
B	160 001–250 000	28 800 + 25% of taxable income above 160 000
C	250 001–346 000	51 300 + 30% of taxable income above 250 000
D	346 001–484 000	80 100 + 35% of taxable income above 346 000
E	484 001–617 000	128 400 + 38% of taxable income above 484 000
F	617 000 and above	178 940 + 40% of taxable income above 617 000

Rebates

Primary	R11 440
Secondary (65 years old and above)	R6 390
Tertiary (75 years old and above)	R2 130

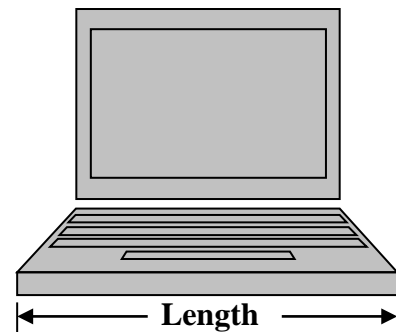
- (a) Determine Kevin's tax bracket. Write down only the letter (A–F) corresponding to Kevin's taxable income. (2)
- (b) Write down Kevin's rebate. (2)

- 5.2 Mr Reddy is a teacher at Kevin's son's school. Mr Reddy is the computer and Mathematics teacher.

5.2.1

Mr Reddy decides to build a model of a computer laptop to help create a subject atmosphere in the computer room.

He drew a scale diagram of the laptop as shown alongside.



- (a) Measure the length of the scale diagram of the laptop. Give your answer in centimetres. (2)
- (b) If the actual length of Mr Reddy's computer is 7,75 times the scale length, determine the scale used in the scale diagram. (2)

5.2.2 Mr Reddy gave his Mathematics learners an assignment to conduct a small survey on how much pocket money the boys and girls in the class spent during the lunch break at school on a particular day. The results of the survey (in rand) were as follows (arranged in ascending order):

The amount of money spent by the boys surveyed:

9	10	10	12	12	12	12	12
14	15	15	16	18	20	25	

The amount of money spent by the girls surveyed:

0	6	6	9	9	10	10	10
11	11	11	11	12	20	25	30

- (a) Write down the total number of learners surveyed. (1)
- (b) Write down the modal amount spent by the boys. (1)
- (c) Calculate the mean amount of money spent by the girls. (4)
- (d) Determine the median amount of money spent by the girls. (3)
- (e) Calculate the difference between the maximum amount spent by a girl and the minimum amount spent by a boy. (2)
- (f) What is the probability that a boy selected at random from those boys surveyed would have spent R10,00? (2)
- (g) Express the likelihood that a learner surveyed would have spent exactly R30,00 during lunch break. (2)

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TOTAL: 150

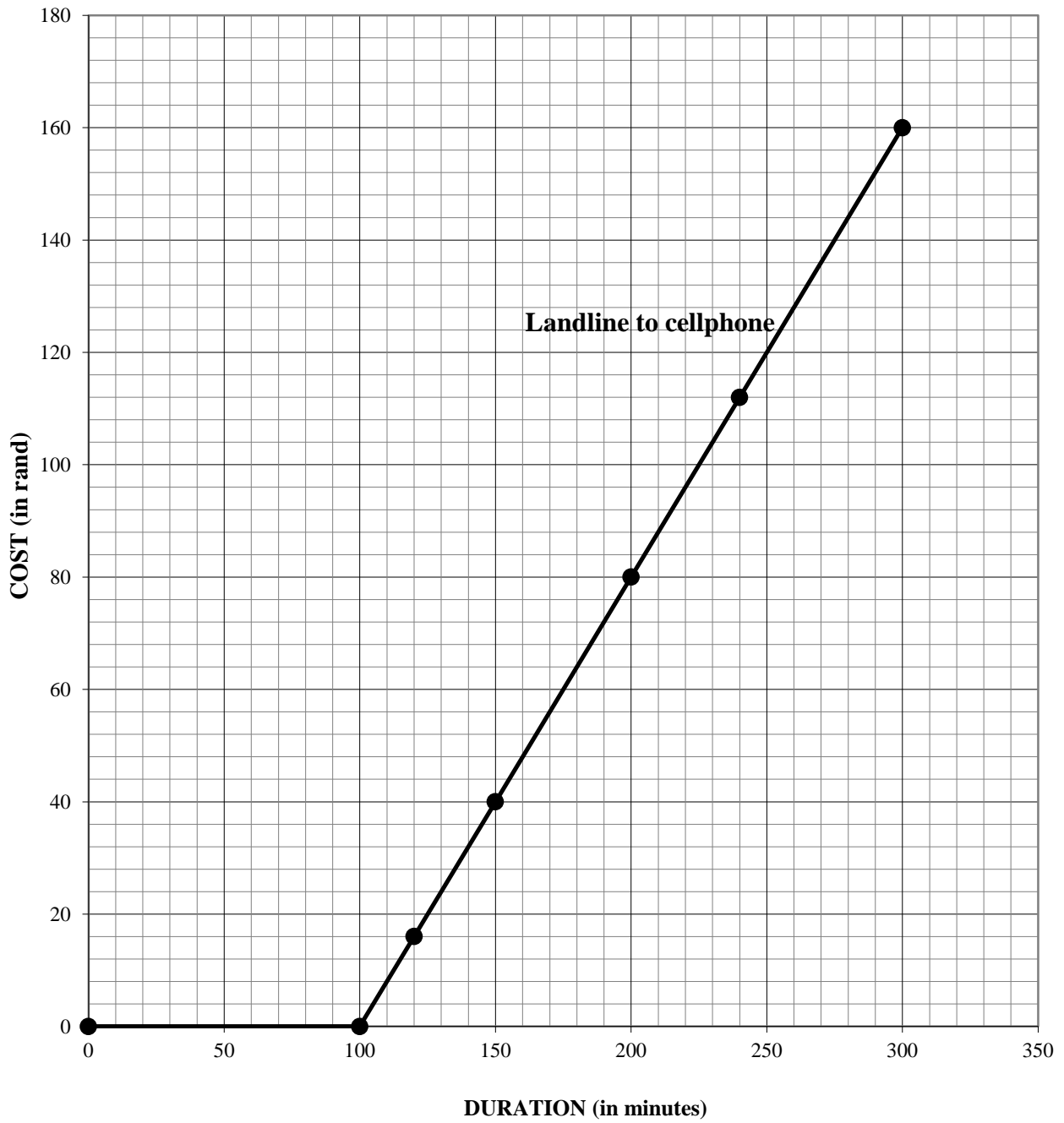
ANNEXURE A

NAME: _____

GRADE/CLASS: _____

QUESTION 1.2.2(b)

PANTSULA'S VARIABLE COSTS



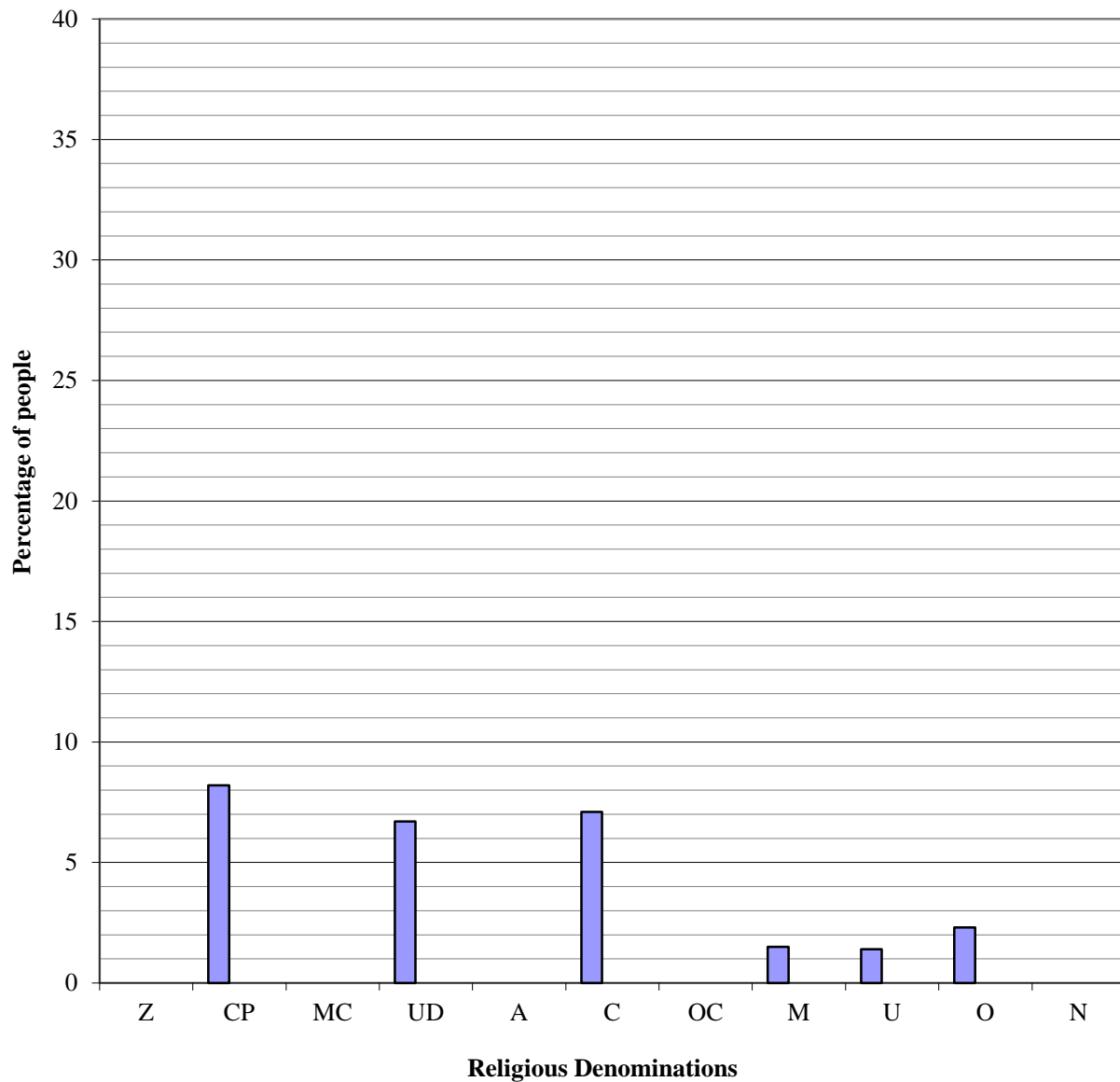
ANNEXURE B

NAME: _____

GRADE/CLASS: _____

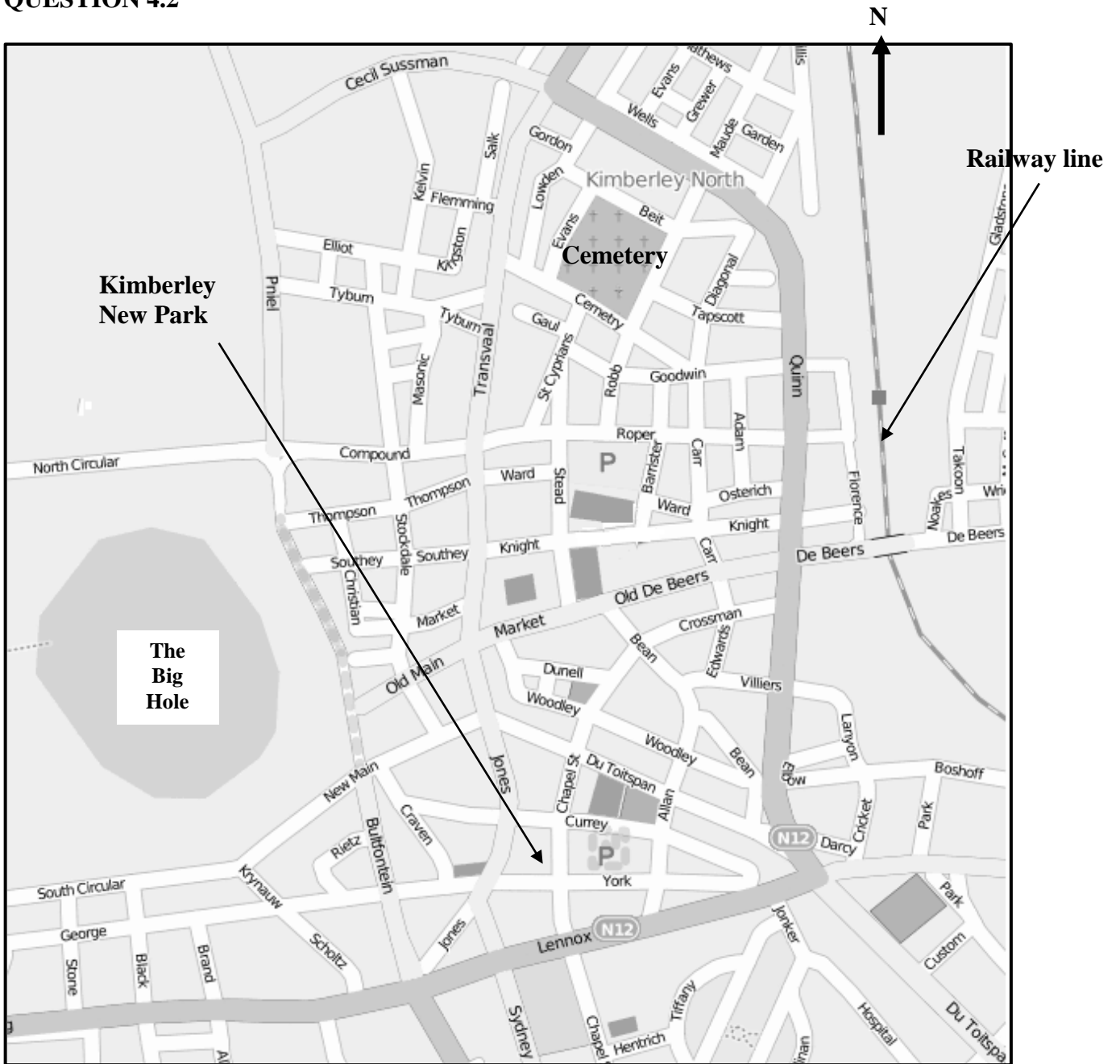
QUESTION 3.1.5

PERCENTAGE OF PEOPLE BELONGING TO RELIGIOUS DENOMINATIONS



ANNEXURE C

QUESTION 4.2



ANNEXURE D**QUESTION 5.1.4****INVESTMENT OPTIONS**