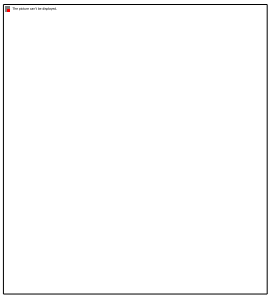
HILLCREST HIGH SCHOOL



Grade 12 Mathematical Literacy Exam

Paper 1

Trials 2018

MARKS: 150 **TIME: 3 hours**

INSTRUCTIONS

1. This question paper consists of 5 questions. Answer ALL the questions.

2. Number the questions correctly according to the number system used in this question paper.

3. Start EACH question on a NEW page.

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

5. Show ALL calculations clearly.

6. Round off ALL final answers to TWO decimal places, unless stated otherwise.

7. Indicate units of measurement, where applicable.

8. Maps and diagrams are NOT necessarily drawn to scale, unless otherwise stated.

9. Write neatly and legibly.

Question 1

1.1 Erin studied the different religious denominations to which people belong in South Africa. The table below shows the information from the 2012 population profile of South Africa.

	Religious Denominations	Symbol	Percentage members
CHRISTIAN	Zion Christian Church	Z	11,1
	Charismatic/Pentecostal churches	CP	8,2
	Methodist	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
	Unsepcified religion	U	1,4
	Other	O	2,3
	None	N	15,1

1.1.1 Which religious denomination has the highest percentage of people that belong to it? (2)

1.1.2 Determine the total percentage of people that belong to Christian denominations. (2)

1.1.3 Determine the range of the data above. (2)

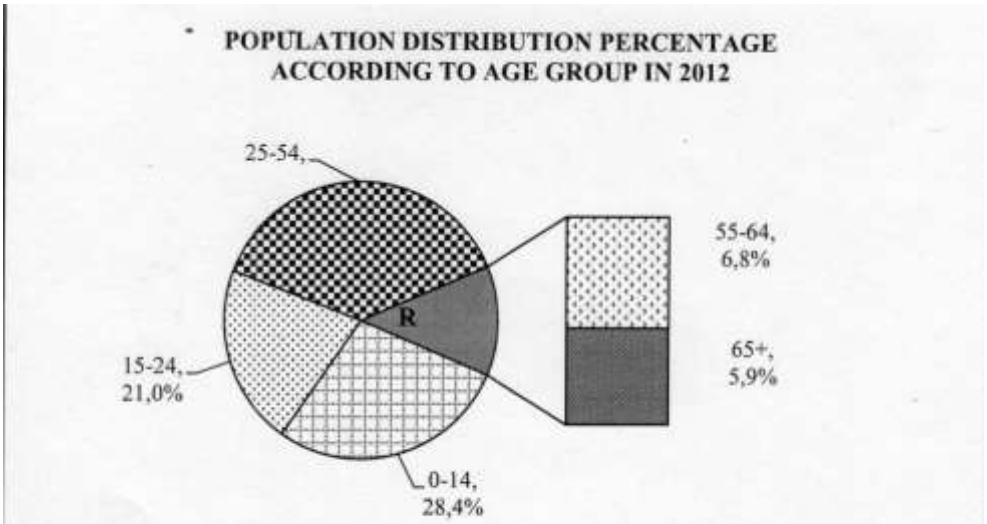
1.1.4 Arrange the religious denominations in ascending order of their percentage members. Use the given symbols. (2)

1.1.5 Use the graph sheet at the back of your answer booklet to complete the bar graph representing the percentage of people belonging to the religions in the table above. (5)

1.1.6 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)

1.1.7 If a person were chosen at random in South Africa, what is the probability that the person would be Catholic? (2)

1.2 Erin 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.

1.2.1 Label the sector marked R on the pie chart. (2)

1.2.2 Calculate the percentage of people in South Africa aged 25 to 54 years of age in 2012? (2)

1.2.3 In which age group did the majority of the people in South Africa fall in 2012? (2)

1.2.4 In which age group is the median age of people in South Africa likely to fall? (2)

1.2.5 In 2012, the growth rate of the South African population was -0,412%. Determine the population of South Africa in 2011 if the population in 2012 was 48 810 427. (4)

Use the formula:

Percentage growth = $\frac{Population\ 2012 - Population\ 2011}{Population\ 2011}$ x 100

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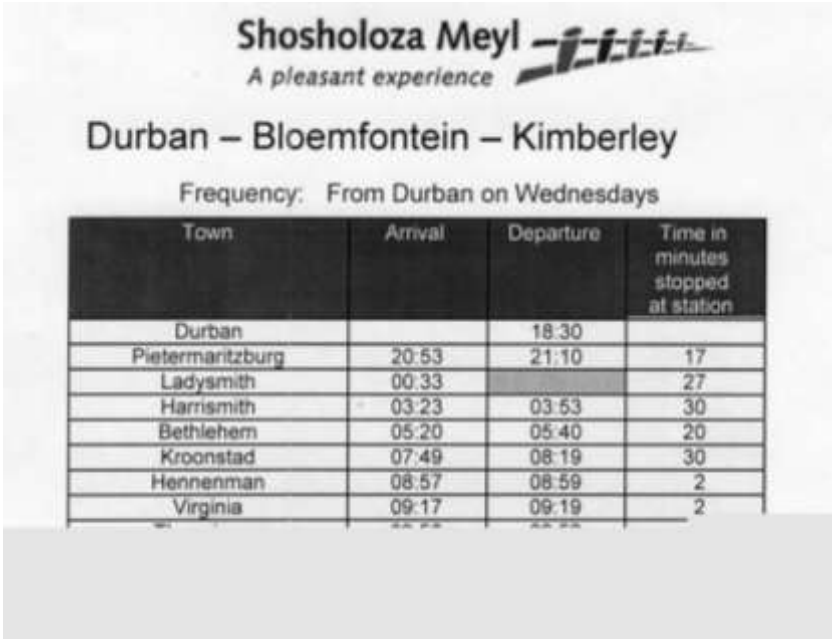
Question 2

A train time-table is displayed for travelling from Durban to Bloemfontein and then to Kimberley.



Shosholoza Meyl
A pleasant experience

Durban – Bloemfontein – Kimberley

Frequency: From Durban on Wednesdays

Town	Arrival	Departure	Time in minutes stopped at station
Durban		18:30	
Pietermaritzburg	20:53	21:10	17
Ladysmith	00:33		27
Harrismith	03:23	03:53	30
Bethlehem	05:20	05:40	20
Kroonstad	07:49	08:19	30
Hennenman	08:57	08:59	2
Virginia	09:17	09:19	2

2.1 On which day of the week does this train from Durban arrive in Kimberley? (2)

2.2 How long did the total journey take? Write your answer in hours? (3)

2.3 At what time did the train leave Ladysmith? (2)

2.4 Calculate the total time taken for stops between Durban and Kimberley. Give the answer in hours and minutes. (3)

2.5 Not counting stops, the actual travel time for the train journey is 17,6 hours and the distance between Durban and Kimberley is 842km. Calculate the average speed at which the train is travelling. (3)

2.6 Tristan travels from Durban to Brandfort on the same train. He needs to board a bus in Brandfort that is leaving the train station at 11:00. It takes 5 minutes to walk from the train station to the bus station. Determine whether or not Tristan will be in time to board the bus. Show ALL the necessary calculations. (3)

[16]

Question 3

3.1 Mulalo Zwane is a Grade 12 learner who makes extra money by baking and selling doughnuts once a week. She spends an initial cost of R60 on electricity and transport. The cost price for ingredients is R2 per doughnut. She sells each doughnut with a mark-up of 150% on the cost price.

3.1.1 Show that the selling price of a doughnut is R5. (2)

3.1.2 Table 1 shows the cost for the number of doughnuts as indicated.

Work out the values of A,B,C and D. (4)

Table 1

Number of doughnuts	0	10	20	40	60	80
Expense in Rands	60	80	A	B	C	D

3.1.3 Table 2 shows the income received for the number of doughnuts as indicated.

Calculate the values of P,Q and R. (3)

Table 2

Number of doughnuts	0	10	20	40	60	80
Income in Rands	0	P	Q	200	R	400

3.1.4 Use the information in Table 1 and 2 to draw the following graphs on the same set of axes on graph paper (Graph sheet attached to Answer Sheet):

Graph A: use the information in table 1

Graph B: use the information in table 2. (4)

3.1.5 How many doughnuts must be sold before Mulalo makes a profit? (2)

3.1.6 Describe how the graph can be used to find the solution to question 3.1.5. (2)

3.1.7 Draw up an income and expense statement for the sale of 68 doughnuts. (3)

3.1.8 Mulalo sold 68 doughnuts last week. How much profit did she make? (3)

3.1.9 If the initial cost increases to R90, how will it affect the graph? (2)

3.1.10 How many doughnuts will Mulalo have to sell to start making a profit with the new initial cost? (2)

3.2 Mulalo's father is 48 years old. He works for the municipality and earns a monthly income of R37 500. In September he gets his annual salary increase and the increase this year is 4,75%.

3.2.1 Calculate his new monthly and annual income. (3)

3.2.2 Use the tax table below to calculate his monthly income tax. (6)

TAXABLE INCOME (RANDS)	**TAX RATE**
R0 – R189 880	18% of each R1
R189 881 – R296 540	R34 178 + 26% of the amount above R 189 880
R296 541 – R410 460	R61 910 + 31% of the amount above R 296 540
R410 461 – R 555 600	R97 225 + 36% of the amount above R 410 460
R555 601 – R708 310	R149 475 + 39% of the amount above R 555 600
R708 311 – R1 500 000	R209 032 + 41% of the amount above R 708 310
R 1500 001 and above	R533 625 + 45% of the amount above R 1 500 000
TAX REBATES	
Primary	R13 635
Secondary (Persons 65-75)	R7 479
Tertiary (Persons 75 and older)	R2 493
TAX THRESHOLD	
Below age 65	R75 750
Age 65 and over	R117 300
Age 75 and over	R131 150

[36]

Question 4

Mrs. Woodrow plans to take part in the 2019 Cape Argus Cycle Tour which is 110 kilometres long.

The Cape Argus is a newspaper which sponsors the cycle tour.

She did some research about the cycle tour and found the following useful information.

1. Cyclists are grouped according to their cycling ability. The groups start the cycle tour at different times, with the fastest cyclists starting first.
2. There are cut-off points en route. These are points that cyclists must pass by at a stipulated time, otherwise they are not allowed to continue cycling.
3. The maximum time allowed to complete the tour is 7 hours.

4.1 Refer to ANNEXURE A and answer the following questions:

4.1.1 Write down the cut-off time at Boyes Drive. (2)

4.1.2 Identify TWO sponsors indicated on ANNEXURE A for this cycle Tour. (2)

4.1.3 According to the map, if a cyclist reaches Perdekloof, he/she still has to cycle 52,2km to finish the tour. How many kilometers has he/she already cycled? (2)

4.1.4 If a cyclist has only 30km left to complete the cycle tour, what was the last cut-off point that he/she passed? (2)

4.1.5 Determine the distance between Steenberg cut-off point and the Noordhoek cut-off point. (2)

4.1.6 Determine the time (in hours) it will take Mrs. Woodrow to finish the cycle tour if her average speed for the whole cycle tour was 15,9km/h. (2)

4.1.7 The winner of the cycle tour in 2018 completed the race in 2:36:17. Convert this time to seconds. (2)

4.1.8 The winner in 2016 completed the race in 2:35:31. State whether this is faster or slower than the 2018 winner and by how much. (3)

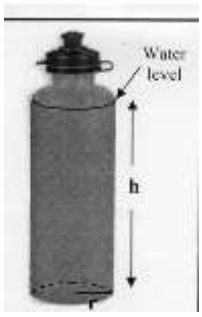
4.2

A cyclist is advised to drink at least 0,5/ of water every hour cycled.

The water bottle used by most cyclists is cylindrical.

The radius (r) of the cylindrical part of the bottle is 3,25cm

and it is filled with water to a height of 15,1cm.



4.2.1 Determine the minimum volume of water a cyclist must drink if he/she cycle for 7 hours. (2)

4.2.2 Determine the surface area of the cylindrical section of the water bottle.

Use the formula:

Surface area of the cylindrical section = 2 x π x r x h,

Using π = 3,14 where r is the radius and h is the height. (2)

4.2.3 Mrs. Woodrow decides that she is going to use a bigger water bottle with a volume of 750ml. How many 750ml bottles of water will she need if she drinks a total of 4200ml of water? (3)

[24]

Question 5

5.1 Katelyn's calendar for the month of May is given on ANNEXURE B. Study it carefully and answer the questions that follow.

5.1.1 If it is Monday 6th May, calculate how many days it is until:

5.1.1.1 Mother's Day

5.1.1.2 Katelyn goes on her school camp. (2)

5.1.2 If it is the 8th May, how many days ago was her dad's birthday? (2)

5.1.3 Will Katelyn go to school on 1st May? Give a reason for your answer. (2)

5.1.4 Katelyn is invited to a party on Saturday 18th May. Will she be able to go? Give a reason for your answer. (2)

5.2 Katelyn lives in Durban and her granny lives in Johannesburg. Study the table below showing weather information for selected South African and answer the questions that follow.

Temperature in °C	Bloemfontein (Bfn)	Cape Town (Ctn)	Durban (Dbn)	Johannesburg (Jhb)	Kimberley (Kmb)	Mafikeng (Mfk)	Musina (Msn)	Nelspruit (Nls)	Pretoria (Pta)	Polokwane (Pol.)
Minimum	5	13	15	6	10	8	20	9	7	3
Maximum	23	22	A	21	24	23	40	22	22	22

Mean (average) maximum temperature = 25,6°C

5.2.1 Calculate the difference in minimum temperature between Durban and Johannesburg. (2)

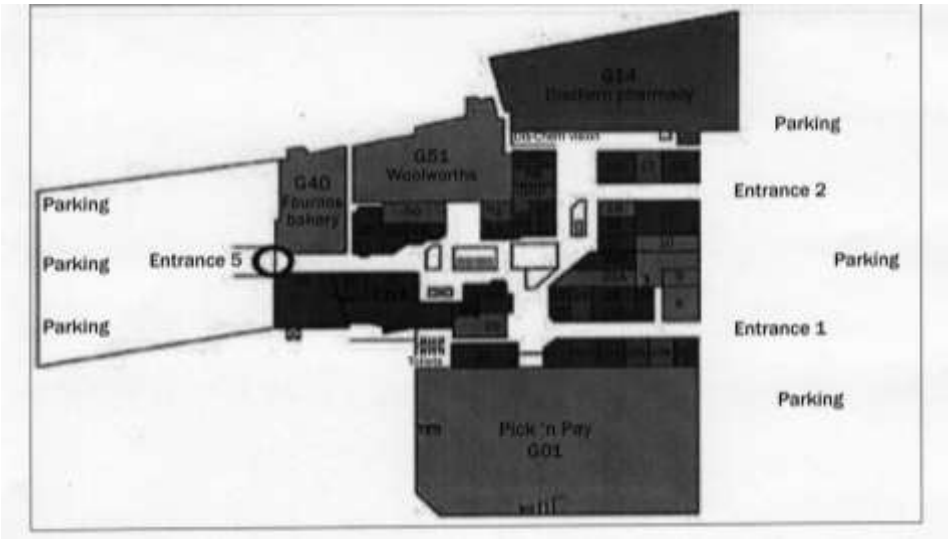
5.2.2 Calculate the maximum temperature, A, for Durban? (3)

5.2.3 Calculate the median of the maximum temperatures. (2)

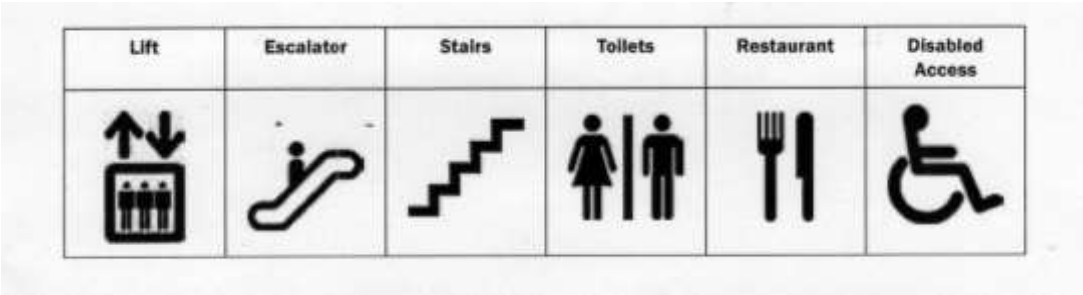
5.2.4 Calculate the percentage of the towns and cities that had a maximum temperature greater than the median. (2)

5.2.5 Determine the inter quartile range for the maximum temperatures. (4)

5.3 Katelyn needs to go shopping for a present for her mom for Mother's Day. Below is a map of the ground floor of the shopping centre. Use the map to answer the questions below.



Below are some symbols to help you .



5.3.1 What does "G51 Woolworths" mean? (2)

5.3.2 Do you think the shopping centre has more than one floor? Explain your answer. (2)

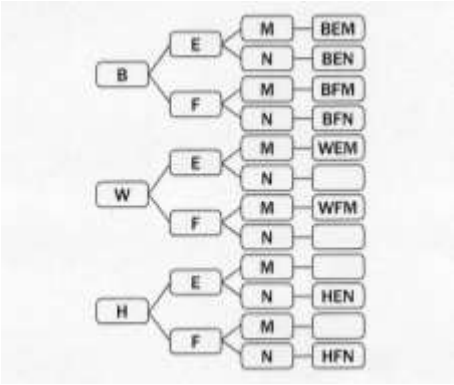
5.3.3 Where should you park if you want to go to Fournos Bakery to buy some fresh bread? (2)

5.3.4 Katelyn decides to buy her mom a scarf from Woolworths. The scarf costs R149,99. Katelyn received €16 from her aunt in France for her birthday. Does she have enough to buy the scarf? Show ALL CALCLATIONS. (4)

€1 = R8,09

5.3.5 Katelyn's friend, Tatum, arrives at entrance 2. Katelyn is still at Woolworths. Give Tatum directions to get to Katelyn who is at Woolworths. (4)

5.4 Katelyn and Tatum decide to go to a coffee shop in the centre for lunch. The coffee shop only sells sandwiches. The sandwiches are made from white (W), brown (B) and whole wheat bread (H). The fillings are egg (E) or fish (F), with mayonnaise (M) or without mayonnaise (N).



There is an incomplete tree diagram above.

5.4.1 Explain what the outcome BEM represents on the tree diagram. (2)

5.4.2 Complete the tree diagram by providing answers for the spaces labeled A, B, C and D. (4)

5.4.3 Use the tree diagram to write the probability in simplified form that a sandwich selected by the girls at random would:

5.4.3.1 be a whole wheat fish sandwich without mayonnaise (2)

5.4.3 2 be a white bread sandwich (2)

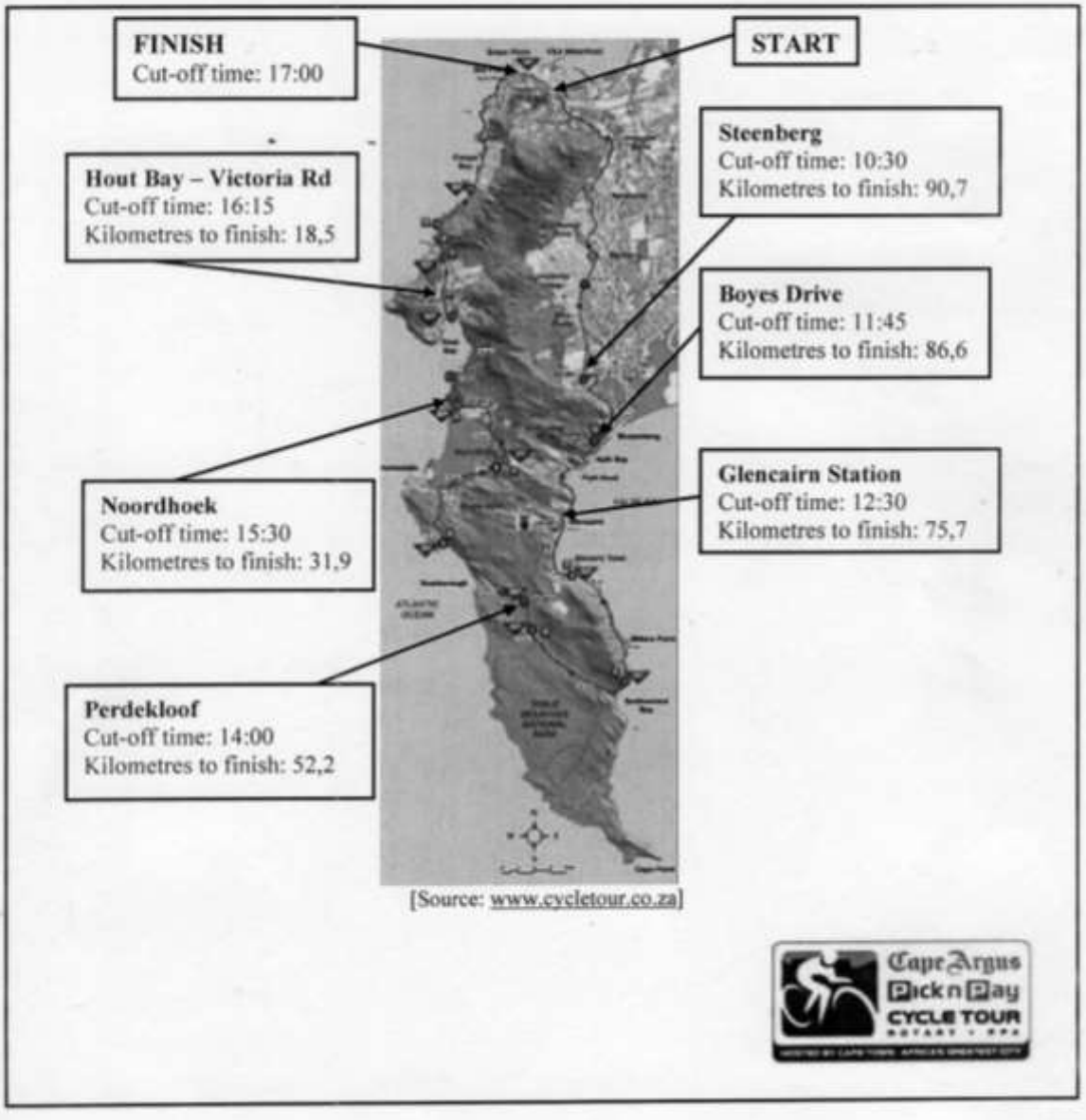
[45]

GRAND TOTAL : 150

ANNEXURE A – QUESTION 4

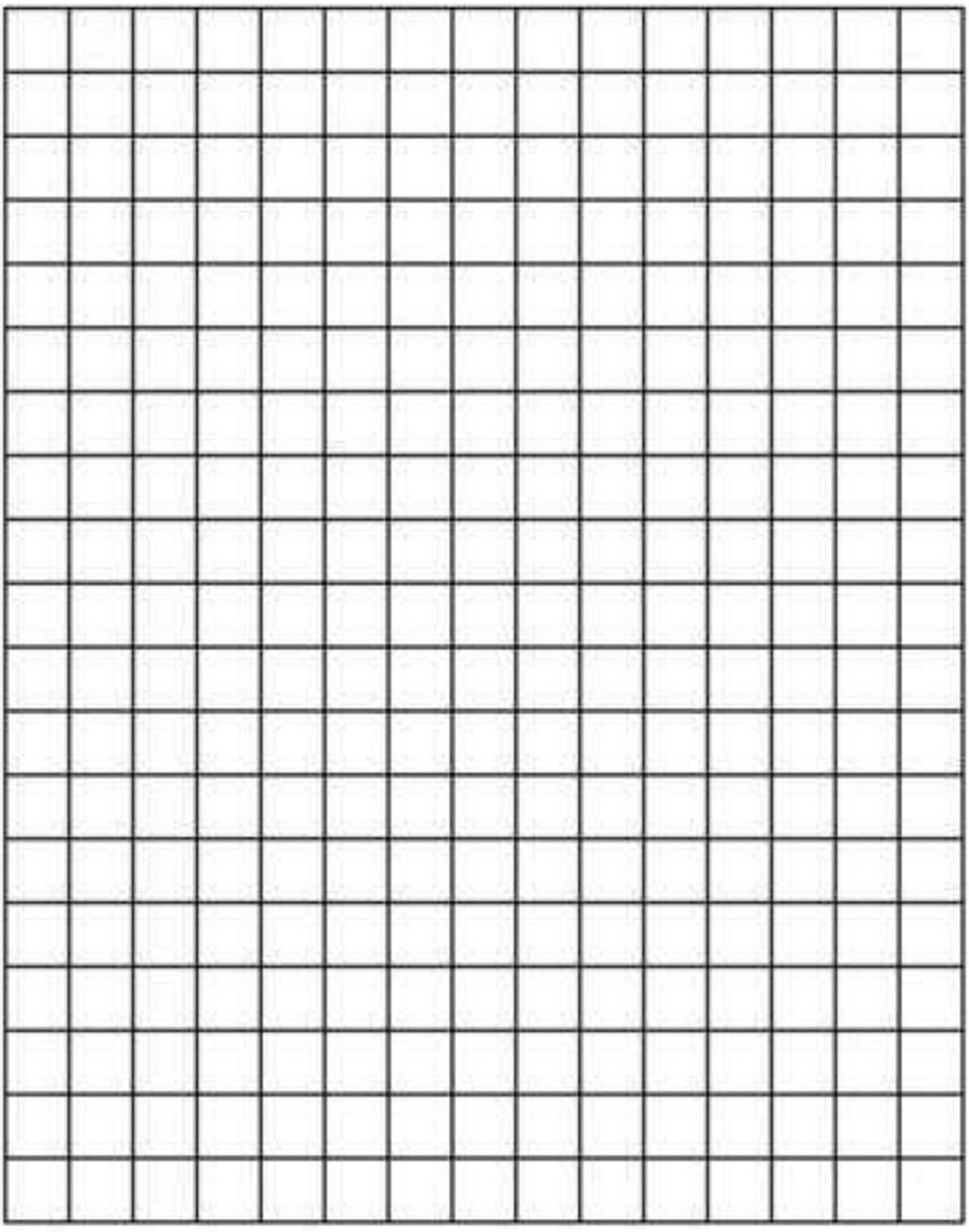
MAP OF THE ROUTE OF THE CAPE ARGUS CYCLE TOUR

The map below shows the names of the six different cut-off points and the distance still left to cycle from that point to the end of the cycle tour.



[Source: www.cycletour.co.za]

QUESTION 3.1.4

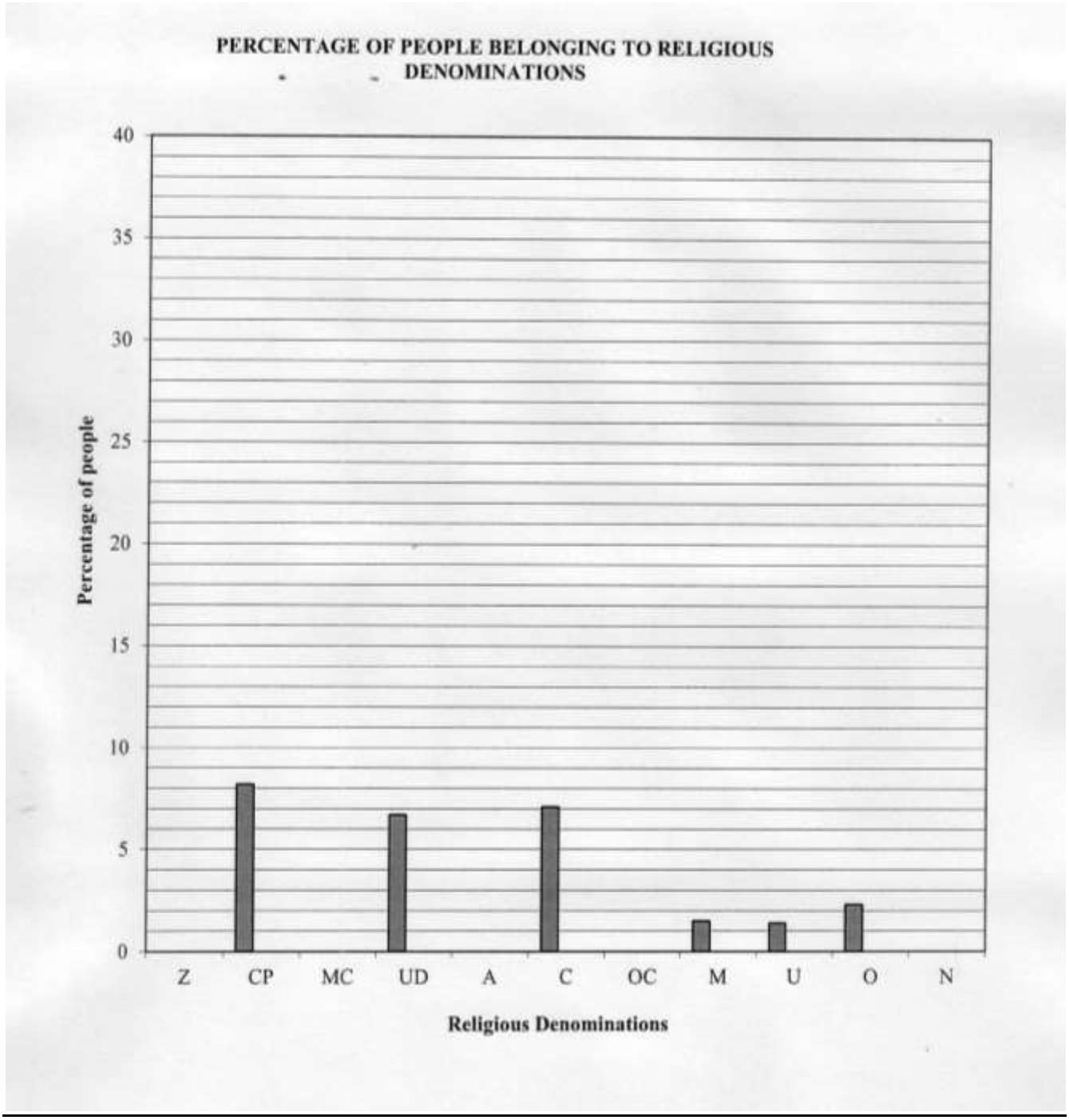


ANNEXURE B – QUESTION 5

MAY 2018

MON	TUES	WED	THURS	FRI	SAT	SUN
		1 **Worker's Day**	**2** Dad's birthday	**3**	**4**	**5**
6	**7** Netball match	**8**	**9**	**10**	**11**	**12** **Mother's Day**
13	**14**	**15**	**16**	**17** School camp	**18** School camp	**19** School camp
20	**21**	**22** Math's Lit Test	**23**	**24**	**25** Granny coming to visit	**26**
27	**28**	**29**	**30**	**31**		

QUESTION 1.1.5


PERCENTAGE OF PEOPLE BELONGING TO RELIGIOUS DENOMINATIONS
40
35
30
25
20
15
10
5
0
Percentage of people
Z
CP
MC
UD
A
C
OC
M
U
O
N
Religious Denominations