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Mathematical Literacy – Exam Paper 1 Grade 12

Examination Date: 5 July 2018

Time: 3 hours

Examiner: Mr S Smith

Marks: 150

Moderator: Mrs F Human

Question	1	2	3	4	5	Total
Learners Mark						
Total	44	19	26	31	30	150

Name and Surname: _____

INSTRUCTIONS AND INFORMATION:

1. This question paper consists of:
 - 28 pages
 - 5 questions
 - The last 3 pages include your addendum's
2. Ensure that your question paper is complete.
3. Answer ALL the questions in the space provided.
4. A non-graphical, non-programmable calculator may be used.
5. ALL necessary calculations must be clearly shown.
6. Units of measurement must be included where applicable.
7. Maps and diagrams are not necessarily drawn to scale, unless otherwise stated.
8. Round off appropriately according to the context unless otherwise stated.
9. It is in your own interest to write legibly and to present your work neatly.

QUESTION 1 [44]

1. The Lindani family buys airline tickets to New York on **17 April 2018**. They intend to visit New York during **November 2018**.



The exchange rate from Rand (ZAR) to Dollar at the time is:

On the 17th April 2018 the spot inter-bank market saw:

Open: 1 USD = 12.0471 ZAR

<https://www.poundsterlinglive.com/best-exchange-rates/us-dollar-to-south-african-rand-exchange-rate->

- 1.1.1 Each return ticket costs R10 539, as seen on the extract below found on Travelstart.

 Etihad Airways	19:35 JNB	26h35m	16:10 ⁺¹ JFK	1 stop	Economy	R10,539
 Etihad Airways	22:55 JFK	35h35m	16:30 ⁺² JNB	1 stop	Economy	

[https://www.travelstart.co.za/search-results/international,](https://www.travelstart.co.za/search-results/international)

Find out how much a ticket is worth in Dollars by making use of the exchange rate given above.

(2)

- 1.1.2 Determine whether their tickets would have been cheaper or more expensive in Dollars if they had bought it the year before, by making use of the exchange rate shown below **for 28/12/2017**:

(3)

On the 28th December 2017 the spot inter-bank market saw:

Open: 1 USD = 12.2634 ZAR

<https://www.poundsterlinglive.com/best-exchange-rates/us-dollar-to-south-african-rand-exchange-rate-1>

- 1.1.3 Explain the reason for your answer in 1.1.2 with reference to the mentioned exchange rates.

(2)

- 1.1.4 When would it have been a better time for an **American** tourist wanting to travel to South Africa, to buy her ticket:

28 December 2017 or 18 April 2018?

Explain your answer.

(2)

- 1.2 The Lindani children have to save their own pocket money for the trip to New York during **November 2018**. They decide to start a lemonade stand after being Given permission by their school's rugby club to sell their goods at league games once a week.

They google a lemonade recipe which yields *2 liters of lemonade concentrate*.

Since they can dilute the concentrate in the ratio of 1:3, they will be able to provide **32 cups** of lemonade to sell from **one batch**.

They intend to make this recipe in tenfold (in other words, ten times more) for **one month's** sales.

The lemonade recipe:

How to Make Homemade Lemonade with Real Lemons

★★★★★
4.5 from 10 reviews

Prep time	Time to Make It
15 mins	15 mins

Learn how to make old fashioned, freshly squeeze homemade lemonade using real lemons.

Author: Rachel Farnsworth
Yield: 8 cups

Ingredients

- 8 lemons
- 2 cups water
- 2 cups sugar

Instructions

1. Cut lemons in half. Juice each lemon through a strainer into a large measuring cup. Keep juicing until you have 2 cups of lemon juice.
2. Pour water into a medium-size saucepan over medium-high heat. Stir in sugar. Continue cooking over heat until sugar is dissolved and liquid looks clear again.
3. Combine sugar solution with lemon juice. This is a lemonade concentrate. When ready to serve, add water to taste.



Print

travelstart COOK Africa's Leading Online Travel Agency 2016

 Johannesburg → New York from R 7,869	 Johannesburg → George from R 1,118
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1.2.1 Calculate the cost of their ingredients for one month if:

- a) 8 lemons cost R15,99 **AND** 4 cups of sugar (1 kg) cost R11,16 (5)

Cost of lemons:

Cost of sugar:

Total cost:

- b) Fill this amount in the **appropriate space of your choice** on the Answer Sheet given on the following page. (2)

1.2.2 Fill in the cost of ice and recyclable paper cups for one month **in the appropriate space of your choice on the answer sheet** if:

- 320 cups are priced at R1,20 per cup **per month** and
- 6 bags of ice at R10,50 per bag are needed **per week**. (2)

Working out space _____

1.2.3 Complete the monthly cost of their stall *in the appropriate space on the answer sheet* if:

- The rent per week is R50 and
- Electricity cost is estimated at R36 **per month.** (2)

1.2.4 Now complete the monthly income and expenditure budget sheet on your **answer sheet** by filling in the **marked open spaces:** (2)

Answer Sheet:

Proposed monthly income and expenditure statement for the lemonade stand			
Income		Expenditure	
	Amount		Amount
Sales	3840,00	<u>Fixed costs:</u>	
		<u>Variable costs</u>	
Total income	1.2.4	Total expense	1.2.4

- 1.2.5 Consult the Income and Expenditure Sheet in **Question 1.2.4** and determine what the **cost price** per cup (filled with lemonade) will be if they intend to sell 320 cups of lemonade every month.

(2)

- 1.2.6 Determine the **selling price** per cup if the **total** income for **320** cups is R3840 per month.

(2)

- 1.2.7 Determine the percentage profit made on each cup by making use of your answers in 2.1.5 and 2.1.6 as well as the formula given below:

$$\text{Percentage profit} = \frac{\text{difference in values}}{\text{original value}} \times 100$$

(3)

- 1.2.8 Determine their profit per month **in Rand**, should all their cups of lemonade sell every month.

(3)

- 1.2.9 The two Lindani siblings aim at saving R7000 each for their trip.
How many months will they have to work to reach their target?

(2)

- 1.2.10 Will their target be met in time for their trip to New York (which is scheduled for November 2018) if they start their lemonade stand on 1 May 2018 and start saving? Support your answer with calculations.

(2)

- 1.3 Peter Lindani decides to invest money into a fixed investment for 6 months.
He finds a good deal at ASBA bank which offers him 5,88% interest per year, compounded monthly.

- 1.3.1 He invests R15 000. Complete the table below to find out what the return of the investment will be **after the first three months**.

(5)

Month	Amount	% interest charged	Calculation	Final amount at month end
1	R15 000			
2				
3				

**There is working out space on the next page if needed.*

Working out space _____

- 1.3.2 With the National Budget Speech delivered at the end of February 2018, it was announced that the Value Added Tax (VAT) will increase by 1% from 1 April 2018. This change in the VAT rate is the first in 25 years. As per example, it implies that a product that used to cost R6,99, will now cost R7,06 with the increase of 1% VAT.

However, retailers have set certain “price points” which the consumer has become used to: for instance, that prices end on 95c or 99c. Therefore, the price will not be advertised as R7,06, but rather as R7,19, according to Pieter Engelbrecht, CEO of Shoprite/Checkers. **He continues stating that the increase will therefore indeed be higher than 1%.**

(translated from Beeld Sake Thursday 1 March 2018)

- 1.3.3 Determine the price increase on a product as mentioned from R6,99 to R7,19 to support the statement mentioned in the last sentence in the article.

(3)

QUESTION 2 [19]

Kheletso is travelling around Kwazulu-Natal, visiting parks and reserves in the province. Study the map of the province and answer the questions that follow:

2.1. How many parks and reserves lie north of Zululand?

_____ (2)

2.2. Which highway would you use from Pietermaritzburg to Estcourt?

_____ (2)

2.3. Which game reserve lies north-west from Hluhluwe Imfolozi Park?

_____ (2)

2.4. List the towns Kheletso will pass on the N2 from the Eastern Cape en route to the Ukhahlamba Drakensberg Park.

_____ (2)

2.5. Express the scale on the map in the form 1: _____. (round off to nearest cm)

_____ (4)

2.6.1. Use the scale to determine the actual distance (to the nearest km), the crow flies from Dundee to Ballito.

_____ (3)

2.6.2. Kheletso calculates that her average speed for the trip from Dundee to Ballito will be 100km/h. How long would the trip take her? Give your answer in hours and minutes.

x

(4)

Question 3 [26]

Due to the water crisis in Cape Town Mr. Tony is planning to build a steel water tank as seen below.



- 3.1 Calculate the total amount of steel needed to build the water tank, in m^2 . (5)

- 3.2 To prevent the tank from rusting an anti-rust paint is used to paint the tank on the inside and the outside.

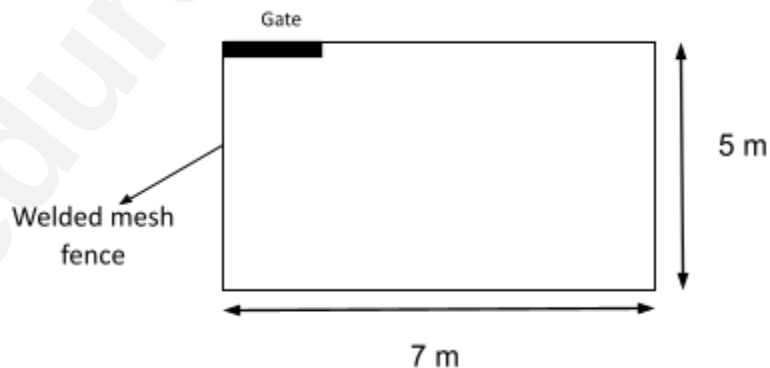
- 3.2.1 If $1l$ of paint can cover an area of $1,65m^2$, how many liters paint will be needed to paint the tank? (3)

- 3.2.2 Calculate the volume of the tank in cubic meters. (3)

- 3.2.3 Convert your answer in 3.2.2 to liters if $1\text{m}^3 = 1000\text{l}$ (2)

- 3.2.4 The tank will be filled with water pumped from a borehole. If the water is pumped at a rate of 15 l/min , how long will it take to fill the tank? Give your answer in hours and minutes. (3)

- 3.3 For safety purposes Mr.Tony needs to put a welded mesh fence around the tank with a single gate of 1.5 m wide for entry as seen in the diagram below.



- 3.3.1 Determine how many meters of welded mesh will be needed for the fence. (3)

3.3.2 The welded mesh is only sold in 5 m rolls at a cost of R399 per roll.

a) Determine the total cost of the welded mesh. (3)

b) What will the total cost of the fence be if the gate costs R680? (2)

3.4 There were six keys on a keyring and only one can unlock the gate.
What is the probability that Mr. Tony will choose the correct key? (2)

Question 4 [31]

Peter is an ardent soccer fan. He studies the teams lined up for the Fifa World Soccer Cup. After some research, he manages to find the information displayed in Addendum A:

4.1 Referring to Table 3: How many Fifa Soccer World Cup tournaments have been presented in the past?

(2)

4.2 Referring to Table 2 : Determine whether any team mentioned has ever played in **every** Fifa Soccer World Cup that has been presented.

(2)

4.3 Germany is currently the number 1 ranked team in the world.

Using Table 2, determine the percentage of all the Fifa Soccer World Cup tournaments they have taken part in.

(2)

4.4 What percentage of all the Fifa Soccer World Cups have the Germans won?
Refer to Table 1.

(2)

4.5 Which host country had the best average attendance at the Fifa Soccer World Cup?

(2)

4.6 What is the average (mean) attendance at the matches for the last five hosted Fifa Soccer World Cup tournaments? Refer to Table 3.

(2)

4.7 Give the range of the number of games played at a Fifa Soccer World Cup.

(2)

4.8 Write down the modal number of teams that have taken part in a Fifa Soccer World Cup.

(2)

- 4.9 By comparing the matches played against the world cups played, determine which country on average plays the most matches at the Fifa World Cup.

(2)

- 4.10 Determine the percentage of times the Fifa Soccer World Cup has been won by other countries than the 5 top performing countries in Table 1.

(3)

- 4.11 Which of the top 10 ranked countries has had the fewest goals scored against them in Fifa World Cups?

(2)

- 4.12 What would the main reason be for them having the fewest goals scored against them?

(2)

- 4.13 Consider the 5 countries that have won the most Fifa World Cup tournaments as well as the countries ranked as the top ten in the world.
Name 2 countries that are unlikely to win the Fifa World Cup this year.
Give a reason for your answer.

(3)

- 4.14 Which country won the first Fifa Soccer World Cup?
What was significant about this win for the country?

(3)

Question 5 [30]

James and Sally decides to go to Cape Town for their holiday.
 Their return flights from JHB to CT and back are listed below.

Depart flight				
Friday, 4 May 2018	5:55 JHB	FA200	8:10 CPT	R999
Return flight				
Sunday, 13 May 2018	8:00 CPT	FA100	10:05 JHB	R999

Category	Features	Price
Lite	Budget Fare, Hand Luggage, Checked-in Bag (Optional)	R799
Standard (RECOMMENDED)	Value Fare, Checked-in Bag (20kg), 2 Flight Changes, Priority Boarding	R999
Premium	All-in Fare, 2 x Checked-in Bags (23kg), Special Equipment, Unlimited Flight Changes, Priority Boarding, Refundable To Voucher, Reserved Seat	R1,298

- 5.1 How long will it take them to fly from Johannesburg to Cape Town? (2)

- 5.2 What is the flight number of their returning flight? (2)

- 5.3 How many nights will James and Sally be staying in Cape Town? (2)

- 5.4 Determine the total cost of their flights between Cape Town and Johannesburg. (2)

- 5.5 Which category flight option has James chosen - lite, standard or premium? (2)

- 5.6 The check-in counter closes 40 minutes before departure time. Sally and James want to get there 15 minutes before the check-in counter closes on their return flight from Cape Town to Johannesburg. At what time should they report at the check-in counter?
(3)

- 5.7 The luggage policy for Safair airlines is as follows:

Hand luggage weighing in excess of 7 kg per bag or which is too large to fit into the overhead stowage compartments will need to be checked in the hold and a checked bag fee would be applicable. **Hand luggage maximum size dimensions (56 x 36 x 23cm). Checked-in baggage maximum size dimensions (90 x 75 x 43cm).**

Calculate the volume of the allowed hand luggage if $\text{Volume} = l \times b \times h$ (2)

- 5.8 James has decided to leave his car at the long-term parking at OR Tambo. He parks his car at 4:00am on 4 May and fetches it at 11:00am on 13 May. Use the tariffs below to calculate what his total parking cost will be.

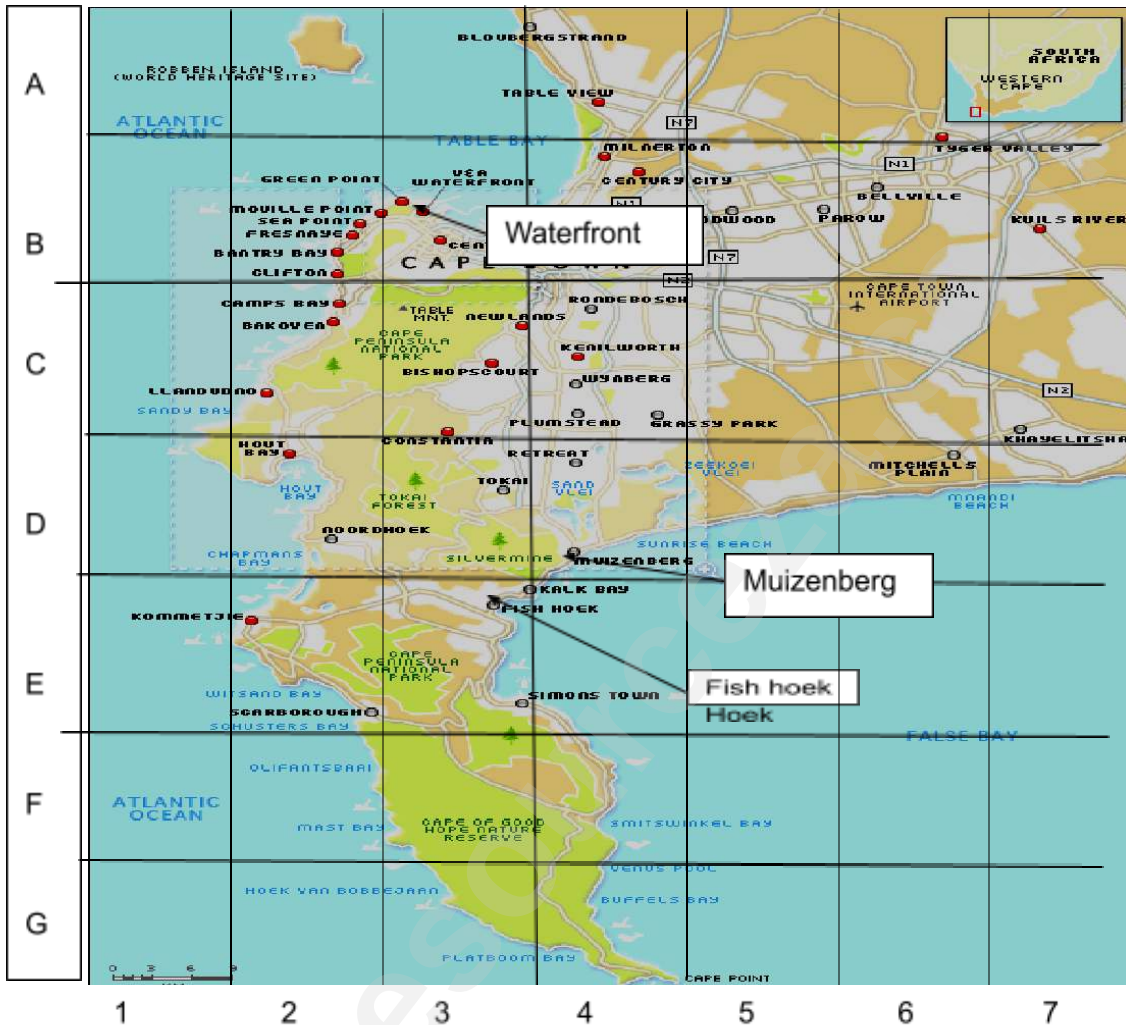
Long Stay parking tariffs	
Time Period	Parking Tariffs
0 – 24 hours	R50
R42 for each extra 12 hours or part thereof	

- 5.8.1) How much will James pay for his first full day of parking? (1)

5.8.2) How many full days will his car be in the parking lot? (1)

5.8.3) Taking into account that the last day is not a full day, what will his total cost be for the full period? (2)

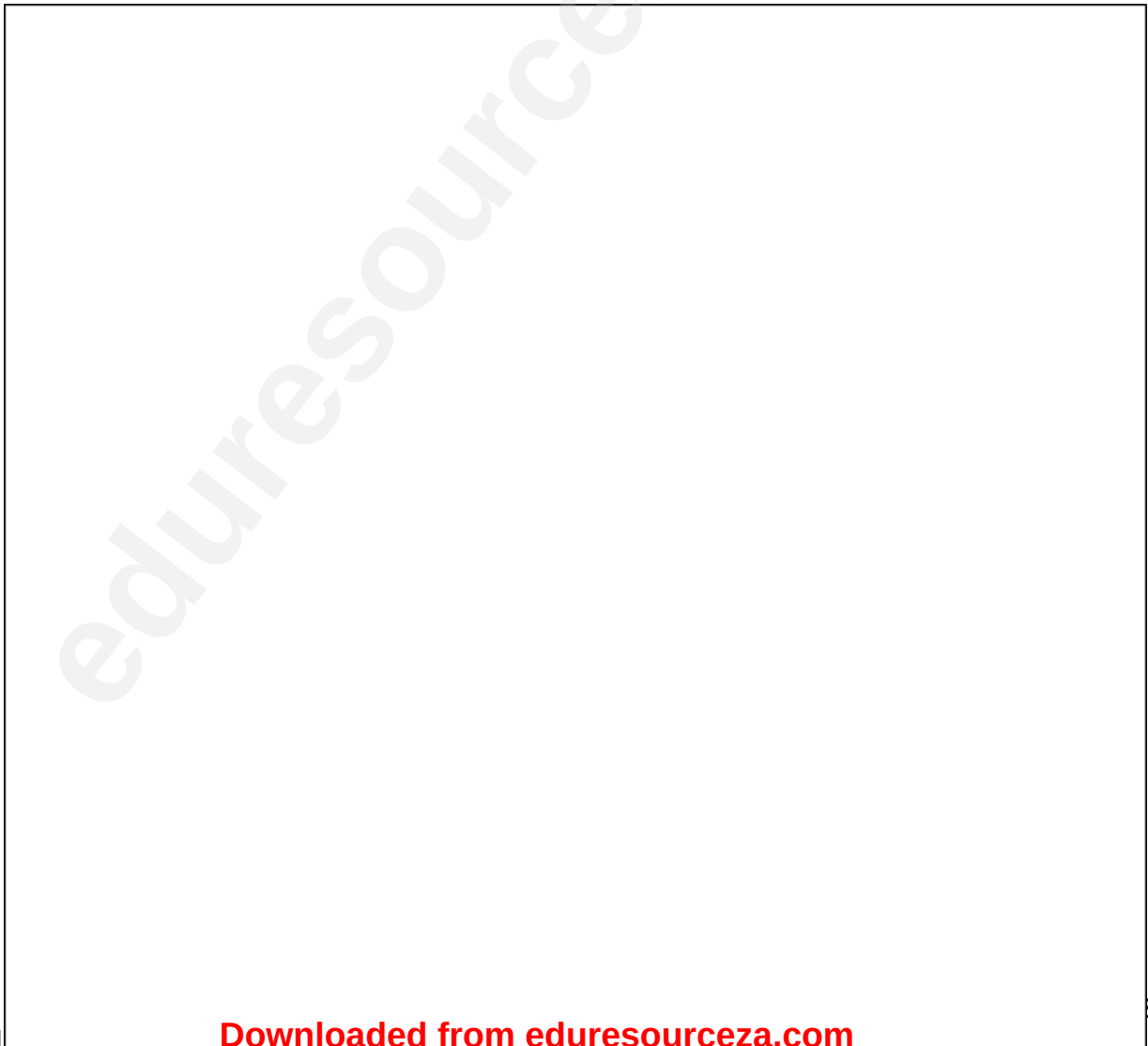
- 5.9 James and Sally rents a car and uses the map of Cape Town found below. Use the map to answer the questions which follow:



- 5.9. 1 James and Sally stays in a guesthouse in Fish Hoek. Give the grid reference of Fish Hoek. (2)
- 5.9. 2 Sally heard that there is an excellent seafood restaurant in Muizenberg. In which direction will they have to travel from Fish Hoek to get there? (2)

- 5.9. James and Sally would like to visit the Waterfront. They were told that the best route
3 is through Noordhoek. Name two towns (other than Noordhoek) that they will travel through. (2)

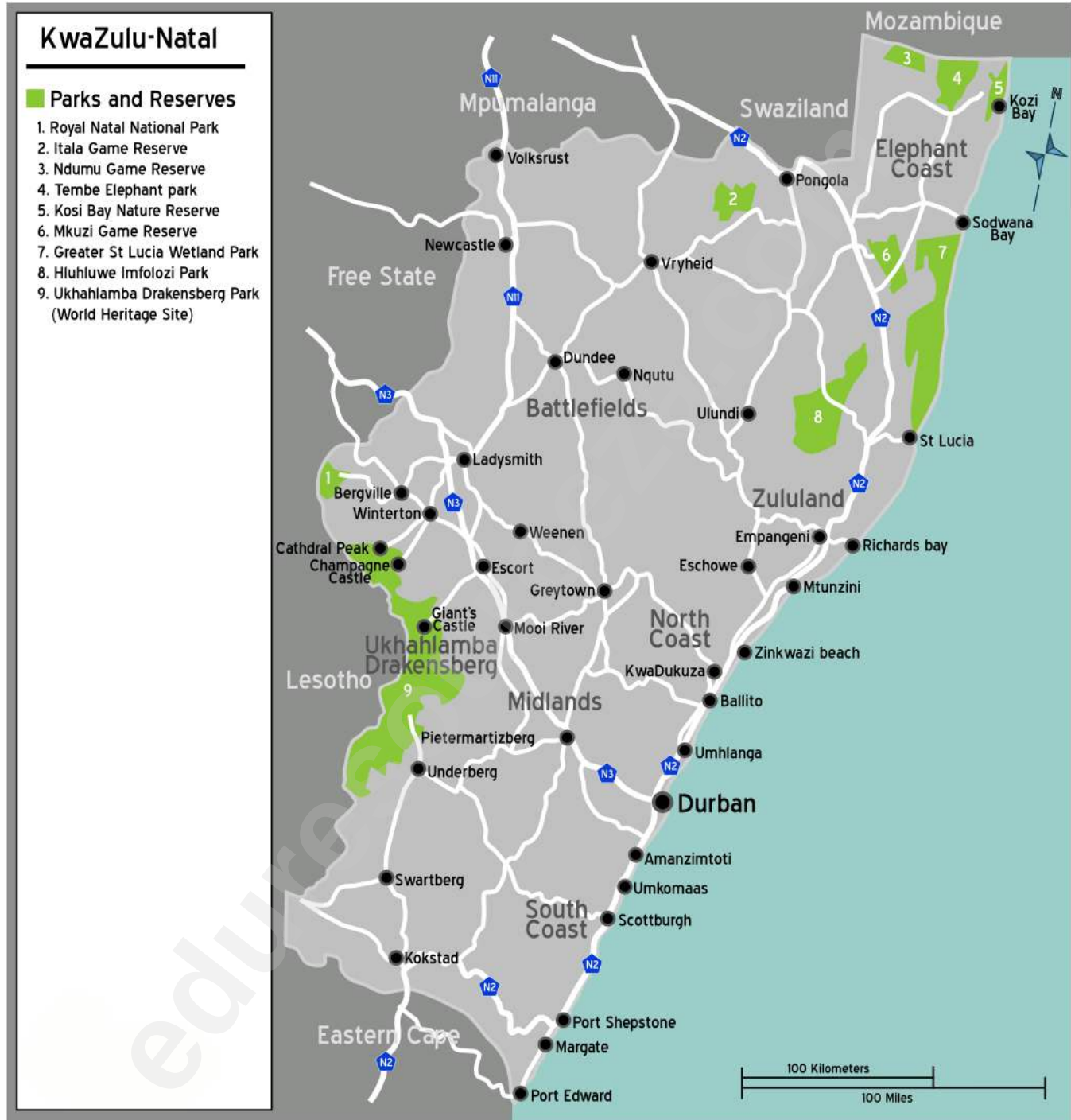
- 5.9. James and Sally discover an ice-cream shop at the Waterfront.
4 The shop has three flavours of ice cream
 • **Chocolate (C), vanilla (V) and strawberry (S)**
and three choices of topping on the ice cream
 • **Nuts(N), jelly tots (JT) and smarties (S)**
a) Draw a tree diagram to illustrate the different combinations of ice cream and list all the outcomes. (3)



- b) What is the probability that James will have vanilla ice cream with smarties as a topping? (2)

END OF PAPER

Question 2 Addendum



Question 4 Addendum

Table 1

TEAMS WITH THE MOST VICTORIES	
TEAM	EDITIONS WINS
 BRAZIL	5  1958  1962  1970  1994  2002
 ITALY	4  1934  1938  1982  2006
 GERMANY	4  1954  1974  1990  2014
 URUGUAY	2  1930  1950
 ARGENTINA	2  1978  1986

Table 2

World Cup Performances								
Rank	Current World Rankings	World Cups Played	Matches Played	Won	Draw	Lost	Goals Scored	Goals Against
1	Germany	18	106	66	20	20	224	121
2	Brazil	20	104	70	17	17	221	102
3	Belgium	12	41	14	9	18	52	66
4	Portugal	6	26	13	4	9	43	29
5	Argentina	16	77	42	14	21	131	84
6	Switzerland	10	33	11	6	16	45	59
7	France	14	59	28	12	19	106	71
8	Spain	14	59	29	12	18	92	66
9	Chile	9	33	11	7	15	40	49
10	Poland	7	31	15	5	11	44	40

Table 3

Host Country and year	Teams	Matches Played	Goals Scored	Average Attendance
2014 Fifa World Cup Brazil	32	64	171	52 918
2010 Fifa World Cup South Africa	32	64	145	49 669
2006 Fifa World Cup Germany	32	64	147	52 491
2002 Fifa World Cup Korea/Japan	32	64	161	42 268
1998 Fifa World Cup France	32	64	171	43 517
1994 Fifa World Cup USA	24	52	141	68 991
1990 Fifa World Cup Italy	24	52	115	48 388
1986 Fifa World Cup Mexico	24	52	132	46 039
1982 Fifa World Cup Spain	24	52	146	40 571
1978 Fifa World Cup Argentina	16	38	102	40 678
1974 Fifa World Cup Germany	16	38	97	49 098
1970 Fifa World Cup Mexico	16	32	95	50 124
1966 Fifa World Cup England	16	32	89	48 847
1962 Fifa World Cup Chile	16	32	89	27 911
1958 Fifa World Cup Sweden	16	35	126	23 423
1954 Fifa World Cup Switzerland	16	26	140	29 561
1950 Fifa World Cup Brazil	13	22	88	47 511
1938 Fifa World Cup France	15	18	84	20 872
1934 Fifa World Cup Italy	16	17	70	21 352
1930 Fifa World Cup Uruguay	13	18	70	32 808