



TOTAL MARKS

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NATIONAL SENIOR CERTIFICATE EXAMINATION
NOVEMBER 2019

MATHEMATICAL LITERACY: PAPER I

EXAMINATION NUMBER

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Time: 3 hours

150 marks

PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY

1. This question paper consists of:
 - 30 pages that include 2 pages at the back for extra calculations or rough work.
 - 5 questions
2. Please check that your question paper is complete.
3. Answer ALL FIVE questions.
4. Answer questions in the space provided on this paper and hand it in at the end of the examination session.
5. A non-graphical, non-programmable calculator may be used.
6. ALL necessary calculations must be clearly shown.
7. Units of measurement must be included where applicable.
8. It is in your own interest to write legibly and to present your work neatly.
9. Maps and diagrams are not necessarily drawn to scale.

Question	1		2		3		4		5		Total	
	Marker	Mod.	Marker	Mod.								
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Signature												
Total	49		18		30		24		29		150	

QUESTION 1

1.1 Global coffee brand Starbucks officially launched in South Africa with its first store opening in Rosebank, Johannesburg, on Thursday, 21 April 2016.

The examiner enjoys coffee and was interested in comparing the cost of coffee at popular places.

The table below compares Starbucks' coffee prices to those from other popular South African coffee shops/restaurants in April 2016.

Starbucks pricing vs competitors (April 2016)

Company	Americano	Caffè Latte	Cappuccino	Espresso
Starbucks (RSA)	R38	R33	R27–R33	R17–R20
Vida e Caffè	–	R26	R20–R26	R15–R20
Seattle Coffee	R26	R29	R21–R29	R16–R18
Mugg & Bean	R21	R25	R20–R26	R15
Wimpy	–	R20	R19–R25	R13–R17
Fego	R21	R23	R21–R33	R16–R20
Europa	R20	R24	R21–R25	R17–R21

[Resource: <<https://businesstech.co.za>>]

1.1.1 (a) Starbucks had already been open for 10 full days before the examiner went there. What was the date on the 11th day, which is when the examiner went there?

(2)

(b) What day of the week was it?

(2)

1.1.2 Calculate the difference in price between a Starbucks Americano and a Europa Americano.

(2)

1.1.3 Calculate the percentage by which a Starbucks Americano is more expensive than a Europa Americano. Round your answer to two decimal places.

(3)

1.1.4 What is the average cost of a Caffè Latte in South Africa?

(3)

1.1.5 The inflation rate from 2015 to 2019 is given in the table below:

Inflation rate compared to previous year	
2018 to 2019	5,27%
2017 to 2018	4,78%
2016 to 2017	5,27%
2015 to 2016	6,34%

(a) What is the modal inflation rate over the given four years?

(2)

- (b) Calculate the price of a Seattle Americano in 2018 if it cost R26 in 2016.

(4)

1.2 Eight years ago (2011) the average cup of coffee cost \$3,00 in Australia.

The diagram below illustrates the costs incurred for a \$3,00 cup of coffee.



[Resource: <<http://malaysiafinance.blogspot.com>>]

1.2.1 State the highest cost incurred for a \$3 cup of coffee.

(2)

1.2.2 Write, in its simplest ratio form, the cost of coffee beans to milk.

(2)

1.2.3 What percentage of the \$3 was spent on the actual coffee beans?

(2)

1.2.4 Calculate the profit (in dollars) that would have been made if 1 200 cups of coffee were sold.

(2)

1.2.5 Determine, in rand, the profit calculated in Question 1.2.4, if the exchange rate in 2011 was 1 ZAR = 0,13301 AUD.

(2)

1.3 In 2011 a home-brewed cup of coffee cost \$0,50 to make.

Complete the sentence by calculating the missing number:

In 2011, in Australia, you would have paid _____ times more for a shop-bought cup of coffee compared to a home-brewed cup of coffee.

(2)

1.4 After having done the research on coffee for this question, the examiner decided to purchase a coffee machine.

The slip is included below. Study the slip carefully and answer the questions that follow:



CLICKS CLUBCARD
CALL 0860 254 257

WELCOME TO
GARDEN ROUTE MALL

K/B ESPRESSO MAKER	R1 299,00
1 BALANCE DUE	R1 299,00
Debit card	R1 299,00
CHANGE	R 0,00
TOTAL BEFORE VAT	R A
TOTAL AFTER VAT	R1 299,00

TAX-CODE
15% VAT
With Clubcard you could have earned 259 points

CASHIER NAME: LUNGISA
C0018 #8673 14:26:30 28DEC2018

THANK YOU FOR SHOPPING AT CLICKS

1.4.1 At which store was the coffee machine purchased?

_____ (2)

1.4.2 State the selling price of the coffee machine.

_____ (2)

1.4.3 Calculate the price of the coffee machine, excluding VAT.

_____ (3)

1.5.2 Determine the cost per kilogram of coffee beans at Slow-Roasted Coffee Shop & Roastery.

(2)

1.5.3 The cost price of coffee is USD 0,08 per ounce. Use the conversion table below to answer the following questions.

Conversion
1 pound = 16 ounces
1 pound ≈ 0,454 kilograms

(a) Determine how many ounces, to the nearest whole number, there are in one kilogram.

(3)

(b) Hence, determine the cost of one kilogram of coffee in USD.

(2)
[49]

QUESTION 2

2.1 Leonard's girlfriend, Stephani, was flying back to Cape Town from Vienna. Leonard decided to track the flight on the internet. A screenshot of all the flights that were in the air at the same time is included below. Note: Stephani's plane is circled.

Study this image and answer the questions that follow:



Note: SCHED → Scheduled ACT → Actual time EST → Estimated time CET → Central European Time

2.1.1 What time was Stephani's flight scheduled to take off?

(2)

2.1.2 If the flight only took off at 10:41 CET, for how long was the flight delayed?

(2)

2.1.3 What is the total distance of the flight (in miles)?

(2)

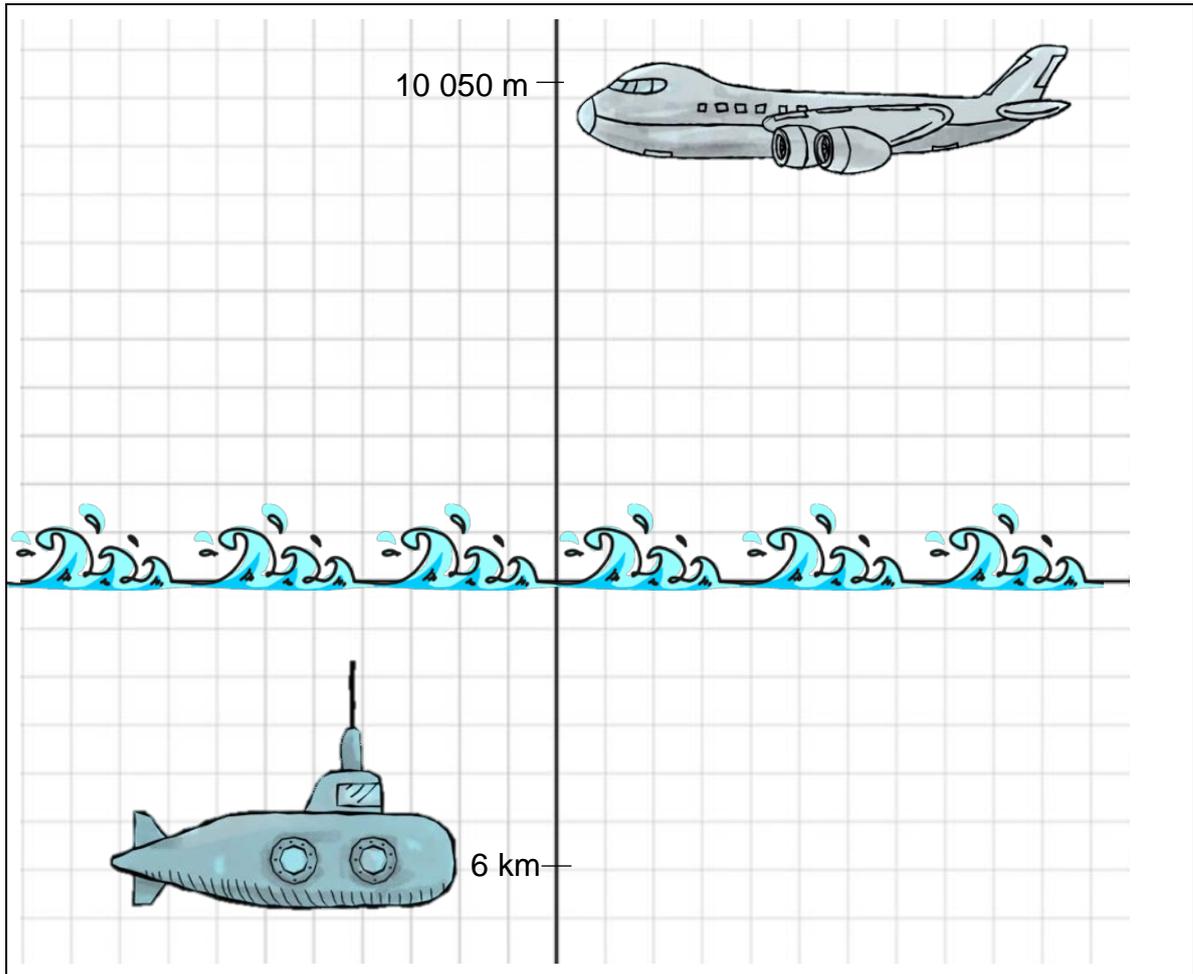
2.1.4 Leonard visited www.travelandleisure.com/airlines-airports/number-of-planes-in-air while doing some research and read the following:

"Aviation data companies like FlightAware keep track of all (or at least most) of the aircraft in our skies. And according to them, in the past year there was an average of 9 728 planes — carrying 1 270 406 people – in the sky at any given time".

If there were twice as many people in the sky at any given time, how many people would it be? Write your answer in words.

(2)

2.2 An aeroplane flies at a height of 10 050 m above sea level and a submarine dives to a depth of 6 km below sea level.



2.2.1 What is the distance between the aeroplane and the submarine in metres?

(3)

2.2.2 On the axis given above, clearly indicate, **using the letter A**, where a small aeroplane flying at a height of 9 843 feet would be, if 1 foot = 0,3048 metres.

Show all the necessary conversion calculations in the space provided below.

(3)

2.3 Stephani landed safely at Cape Town International Airport at 23:06. Below is a map of the airport drawn to a scale of 1:5 000.



[Resources: <<https://capetown-airport.co.za/airport/airportparking/parkingmap>>]

2.3.1 What is the general direction from P5 to Domestic Arrivals?

(2)

2.3.2 The length of the building, P1, is 54 mm. Using the given scale, determine the actual length of the building in metres.

(2)

[18]

QUESTION 3

- 3.1 Mina is a baker who specialises in baking wedding cakes. The most popular cake she bakes is a carrot cake with cream cheese frosting. Study the recipe given below and answer the questions that follow:

Prep time 20 minutes

Cook time 1 hour

Servings 12

Calories 464 kcal

Ingredients

Carrot Cake

- 2 cups (400 g) granulated sugar
- 2¼ cups finely grated carrots
- 1 cup each of chopped walnuts & raisins
- ½ cup crushed pineapple
- 1½ tsp. salt
- **2 tsp. baking soda**
- ¼ tsp. nutmeg
- 2 tsp. ground cinnamon
- **2¾ cup (360 g) cake flour**
- 1 tsp. pure vanilla extract
- 3 large eggs, at room temperature
- 1¼ cup (250 g) vegetable oil

Cream Cheese Frosting

- 8 ounces cream cheese, softened
- ½ cup salted butter
- 4 cups powder sugar
- 1 tsp. vanilla extract

Instructions

Carrot Cake

1. **Heat the oven to 350° F.**
2. **Prepare two 8-inch round baking pans.**
3. Beat the sugar, oil, vanilla, and eggs in a mixer until it is light yellow, about 3 minutes.
4. In a separate bowl, sift together flour, cinnamon, nutmeg, baking soda, and salt and mix on low speed; slowly and gently add in the dry ingredients.
5. Fold in raisins, nuts, carrots, and pineapple.
6. Divide the batter equally between the pans. Bake for 60 minutes or until a toothpick comes out nearly clean. A few crumbs are what you want for a **MOIST** cake!
7. Allow the cakes to cool completely on a wire rack – this will take 25 minutes.

Cream Cheese Frosting

1. **ONCE THE CAKE HAS COOLED COMPLETELY**, place room-temperature butter, cream cheese, and vanilla into mixer and blend for 1 minute on medium.
2. Add powder sugar, one cup at a time, until frosting is light and creamy. Whip cream cheese frosting for 3 minutes or until light and fluffy.
3. Cover cake in frosting – this takes 12 minutes.



3.1.1 How long will it take to prepare and bake the cake?

(2)

3.1.2 Read the "Instructions" carefully and determine at what time Mina will finish baking **and** frosting a cake if she started preparing at 09:30.

(4)

3.1.3 Study the given Fahrenheit oven dial below. By how many degrees (°F) does the dial need to be turned to reach the required temperature to bake the cake?



(2)

3.1.4 Mina's oven works in degrees Celsius. Help her convert 350° F to the nearest 10° C, by using the following formula:

$$^{\circ}\text{C} = \frac{5}{9}(350^{\circ}\text{F} - 32)$$

(2)

3.1.5 Mina uses the measuring jug shown below.



(a) What is the capacity of the measuring jug in litres?

(2)

(b) One gram of cake flour equals 2,36 millilitres.

Indicate on the measuring jug, by drawing a clear line labelled with the letter **B**, where Mina would measure the amount of flour needed to make the cake.

(3)

3.2 Mina has three round baking pans in her kitchen, each with a diameter as shown below:



3.2.1 The recipe requires Mina to use a pan with a diameter of eight inches. Determine, with calculations, which pan (A, B or C) she must use, if one inch = 2,54 cm.

(3)

3.2.2 Calculate the volume of the baking pan chosen in Question 3.2.1, if the pan has a height of 6 cm.

Volume of a cylinder = Area of the base × H
 Where: *H = height of the baking pan*

(3)

- 3.2.3 If Mina used a square-based baking tin with the volume as calculated in Question 3.2.2 and same height as given above, calculate the length (to the nearest whole number) of the sides of the baking tin used.

$$\text{Volume of a square-based prism} = L^2 \times H$$

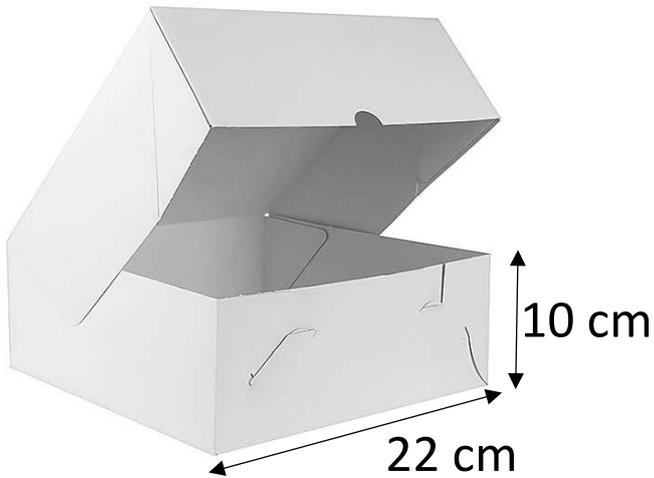
Where:

L = length of the side of the square base

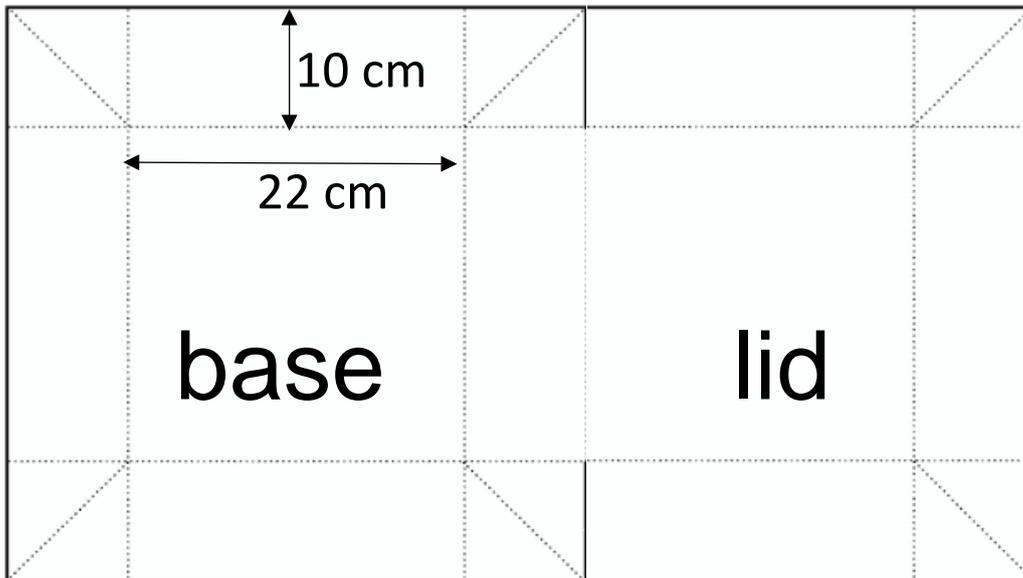
H = height of the baking pan

(4)

3.3 Once the cake is baked, cooled and iced, Mina puts each cake in a box. The net of the box, not drawn to scale, is given below.



Net of the box:



3.3.1 Calculate the length and width of the net of the box.

(3)

3.3.2 Calculate the total amount of cardboard needed to make this box.

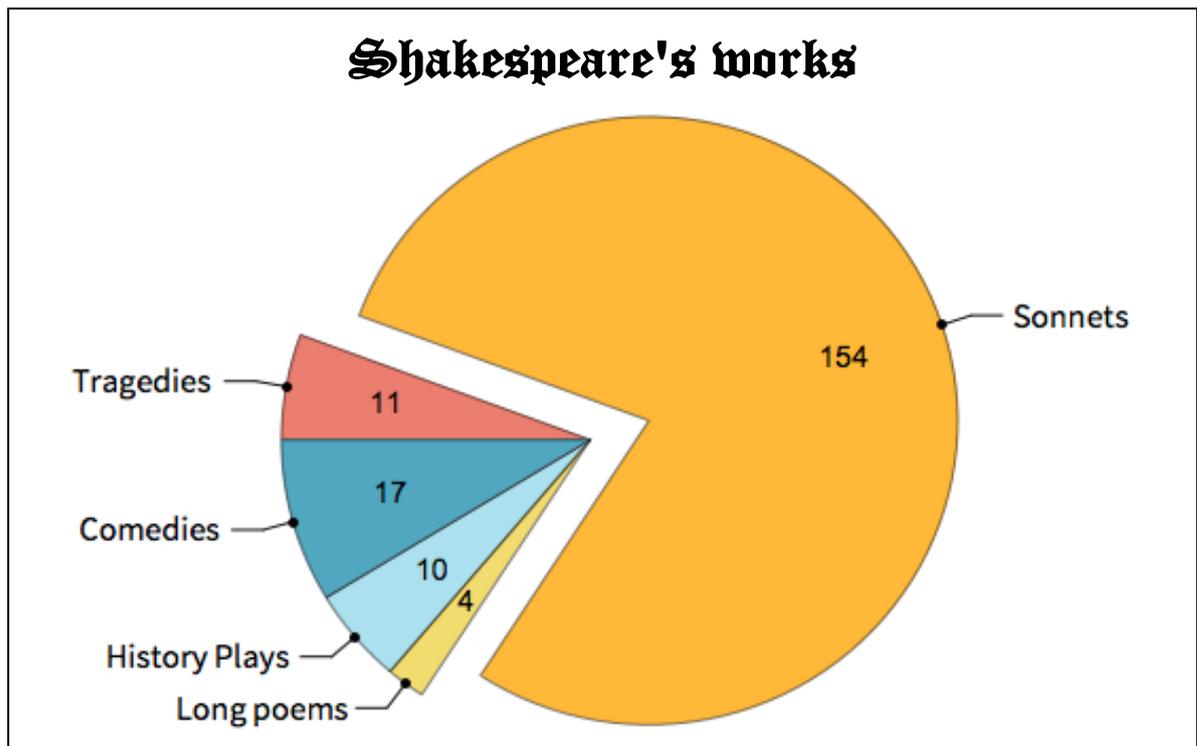
(2)
[30]

QUESTION 4

4.1 William Shakespeare (April 26, 1564–April 23, 1616) is considered by many to be the greatest writer of the English language.

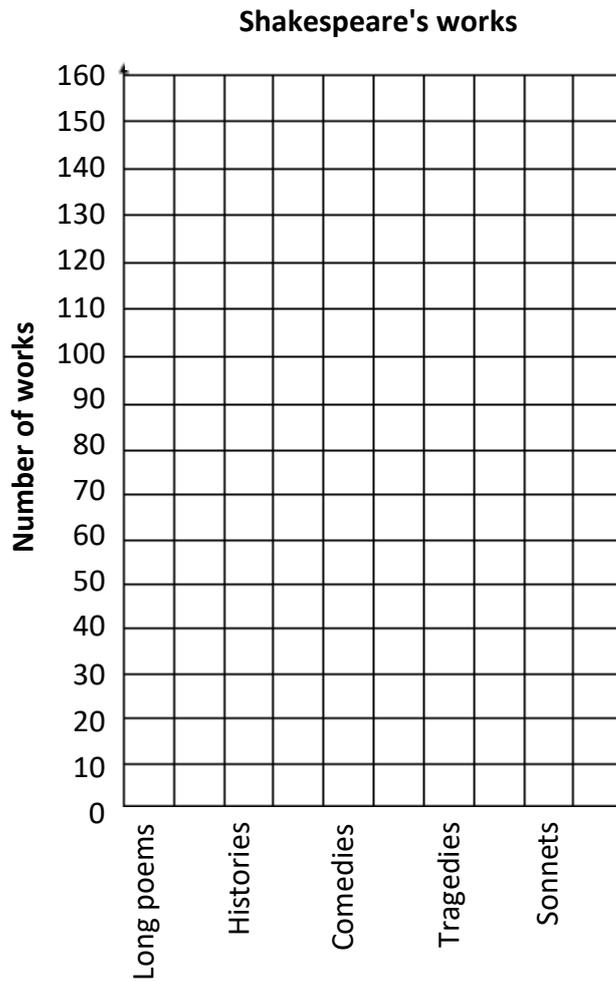
He wrote 154 sonnets, 38 plays (divided into three main groups: comedy, history, and tragedy), and four long narrative poems.

This information is presented in the pie chart below:



[Resource: <<http://blog.wolfram.com>>]

4.1.1 Represent the data as a bar graph on the grid below.



(3)

4.1.2 How many artistic pieces (sonnets, plays and poems) did Shakespeare write altogether?

(2)

4.1.3 Determine what percentage of his works, rounded to the nearest 10%, consists of sonnets.

(3)

4.1.4 Calculate the size, in degrees, of the sector representing "comedies".

(2)

4.2 There are many phrases we use in English today that we owe to Shakespeare. Phrases like: "heart of gold", "good riddance", and "so-so".

Counting the letters in these three phrases, determine the probability of counting the letter "o". Write your answer in simplified fraction form.

(3)

4.3 Study a snippet of an infographic on Shakespeare and answer the questions that follow:

LONGEST PLAYS BY NUMBER OF WORDS		SHORTEST PLAYS BY NUMBER OF WORDS	
TITLE	WORD COUNT	TITLE	WORD COUNT
Antony and Cleopatra	1 361	A Midsummer Night's Dream	605
Othello	1 309	King John	621
Troilus and Cressida	1 301	Richard II	636
Hamlet	1 250	Titus Andronicus	662
Coriolanus	1 240	Commedy of errors	664

SHAKESPEARE'S 10 MOST TALKATIVE CHARACTERS	
CHARACTER	NUMBER OF LINES
Falstaff	471
Henry V	377
Hamlet	358
Duke of Gloucester	285
Othello	274
Iago	272
Antony	253
Richard III	246
Timon	210
Cleopatra	204

Shakespeare created 1 380 characters, 1 221 of whom had speaking parts!

[Resource: <www.nosweatshakespeare.com>]

4.3.1 What is the number of words in the longest Shakespearian play?

(2)

4.3.2 If the minimum number of words spoken in a Shakespearian play is 605 words, calculate the difference between the number of words spoken in the longest and shortest Shakespearian plays.

(2)

4.3.3 Of the 1 380 characters created by Shakespeare, how many did not have speaking parts?

(2)

4.3.4 Refer to the table listing Shakespeare's 10 most talkative characters and determine:

(a) the mean number of lines spoken.

(3)

(b) which characters are within the 75th percentile of Shakespeare's most talkative characters.

(2)
[24]

QUESTION 5

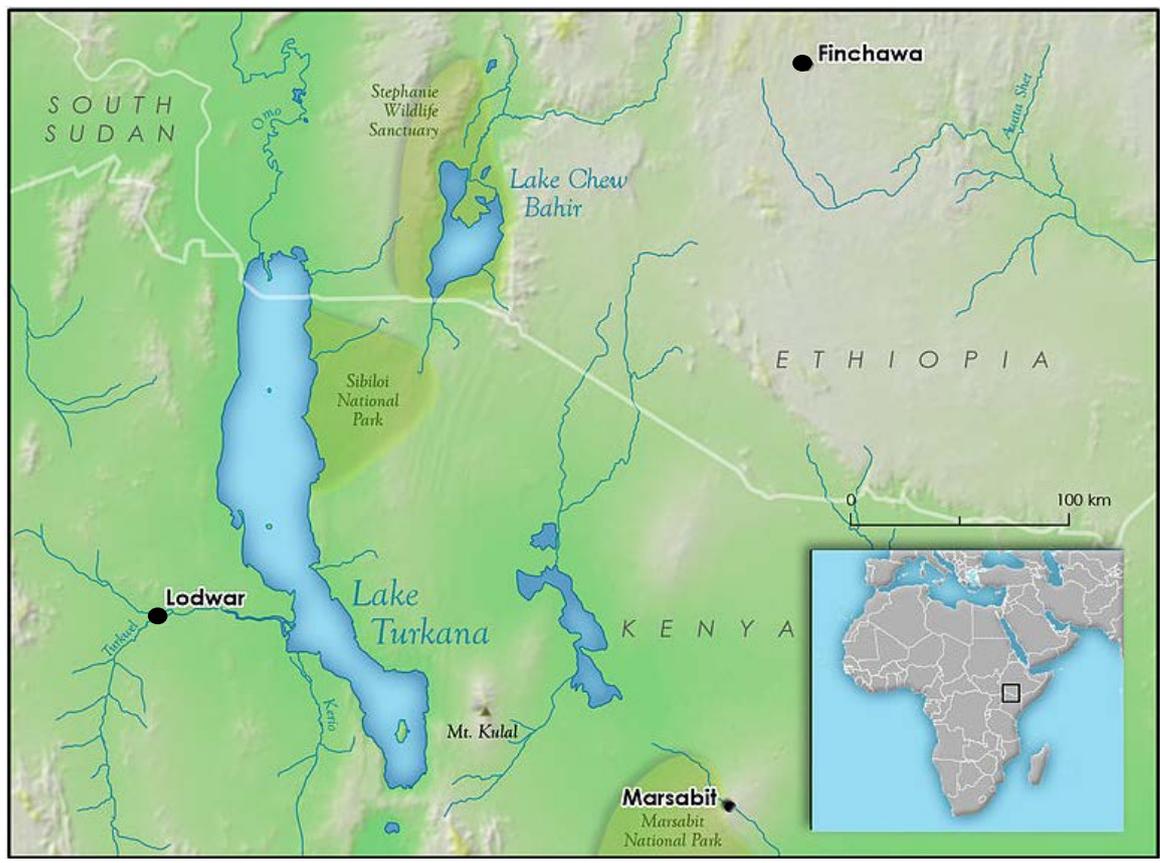
5.1



Wakanda is a fictional country, created by Marvel Comics, located in sub-Saharan Africa. It is home to the superhero Black Panther.

Wakanda first appeared in *Fantastic Four* #52 (July 1966), and was created by Stan Lee and Jack Kirby.

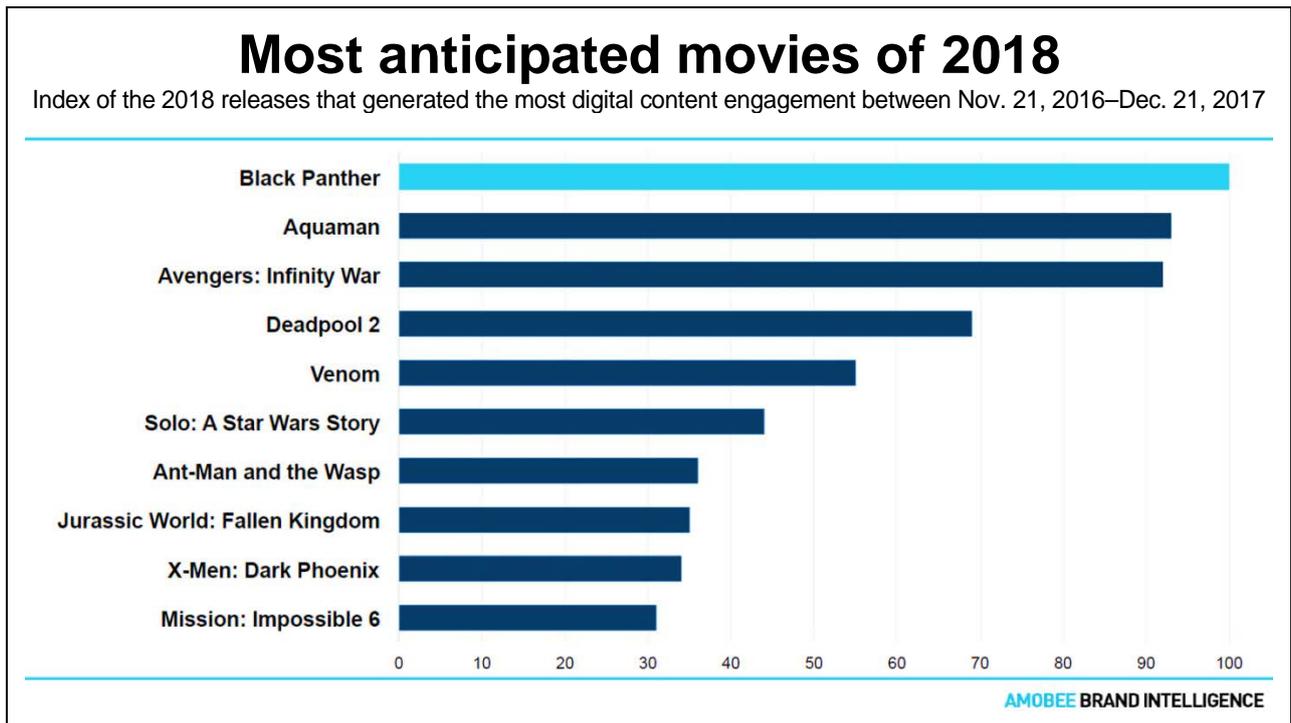
In the Marvel Comic Universe, Wakanda is located just north of Lake Turkana, at a point bordering Kenya, Ethiopia, Uganda, and South Sudan.



If the map distance between Lodwar and Finchawa measured 11,3 cm, then determine, using the bar scale, the actual distance between these two cities.

(3)

5.2 The graph below indicates the most anticipated movies of 2018.



[Resource: <www.cnn.com>]

5.2.1 Which movie was the third most anticipated movie of 2018?

_____ (2)

5.2.2 Assuming every person interviewed could vote for only one movie, estimate how many people, to the nearest 100, were interviewed in this survey.

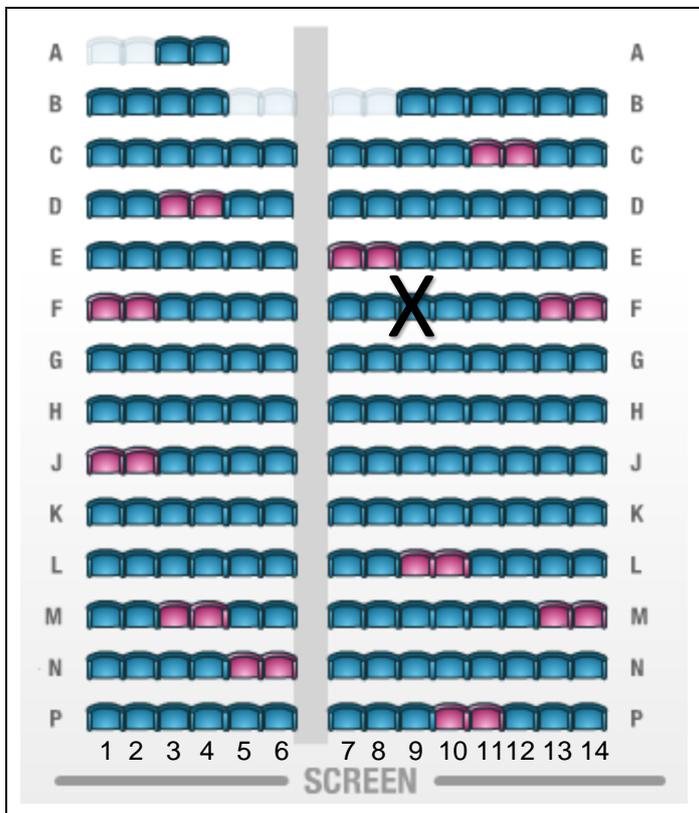
_____ (3)

5.2.3 Marvel's *Black Panther*, released 29 January 2018, leapt across the \$1B mark globally by 31 March 2018, and is now Marvel's 5th movie to ever pass \$1B. [Resource: <www.deadline.com/2018/03/black-panther-crosses-1-billion-worldwide-box-office>]

How much money was earned **per day** from the release date to 31 March 2018?

(3)

5.3 Siphokuhle bought a ticket to watch *Black Panther*. The seating plan is given below:



5.3.1 What is the seat number of the seat marked with an X?

(2)

5.3.2 If 22 tickets had been sold and each ticket cost R76 per person, determine how much money this cinema made.

(2)

5.3.3 How many tickets can the cinema sell in total for this movie house?

(2)

5.4 Philip and three friends decided to go and watch *Black Panther*. Philip is a Standard Bank Gold Credit Card holder. If it costs R76 per ticket, determine how much Philip would pay for the four tickets.

Buy 4 movie tickets, pay for 3*.
With your Standard Bank Gold Credit Card.
[Click here to apply.](#)

YOUR NEXT MILLION™
POWERED BY YOU AND YOUR GOLD CARD

*Ts&Cs apply

(3)

5.5 Ster Kinekor advertises the following Mega Combo:



5.5.1 If one item on the list is chosen at random, what is the probability of choosing a coke as a drink?

_____ (2)

5.5.2 What is the probability of choosing Jelly Tots as a sweet?

_____ (2)

5.5.3 What is the probability of choosing a Coke and Jelly Tots?

 _____ (2)

5.5.4 Calculate the percentage profit mark-up on popcorn if the cost to make popcorn is 185c and it is sold for R25.

 _____ (3)
[29]

Total: 150 marks

