

HILLCREST HIGH SCHOOL



Grade 11 Mathematical  
Literacy Exam  
Paper 1  
November 2015

Examiner: Mr. Hopkins

Moderator: Mrs. Woodrow

MARKS: 100

TIME: 2 hours

**INSTRUCTIONS**

1. Write your name and your teacher's name on your answer book.
2. This question paper consists of 6 questions. Answer ALL the questions.
3. Number the questions correctly according to the number system used in this question paper.
4. Start EACH question on a NEW page.
5. You may use an approved calculator (non-programmable and non-graphical), unless stated otherwise.
6. Show ALL calculations and steps clearly.
7. Round off ALL final answers to TWO decimal places, unless stated otherwise.
8. Indicate units of measurement, where applicable.
9. Maps and diagrams are NOT necessarily drawn to scale, unless otherwise stated.

### Question 1

- 1.1) **Michael Joseph Jackson** (August 29, 1958 – June 25, 2009) was an American singer, songwriter, record producer, dancer, and actor. Called the King of Pop, his contributions to music and dance, along with his publicized personal life, made him a global figure in popular culture for over four decades.



- 1.1.1) Michael Jackson was popular for over four decades. How many years is this? (1)
- 1.1.2) How old was he when he died? Write your answer as years, months, weeks and days. (4)  
(Hint: there are 31 days in August)
- 1.2) Between the years of 1984 and 1990, in the early years of the Aids epidemic, the increase in aids patients could be given by the formula:  $P = 2170,36t^2 + 1707,05t + 1998,04t^3 - 4408,08$  where P represents the number of patients and t represents the number of years after 1984 (1984 being year zero). E.g. 1985 would be year one and 1986 would be year 2, and so on.
- 1.2.1) Calculate the number of Aids patients in 1986 by substituting into the given formula. Round off the answer to the nearest whole number. (3)
- 1.2.2) When asked to calculate the number of patients in 1990, Carla gave the answer of 32 156. Is she correct? If not, calculate how many patients is she wrong by? Round your answer off to the nearest whole number. (3)
- 1.3) It costs R120 to make a large 20 liter tub of ice-cream. It is then repackaged as smaller 200ml tubs for resale.
- 1.3.1) Calculate the breakeven price of a 200ml tub of ice-cream. (4)
- 1.3.2) Calculate the selling price per 200ml container that will give the shop owner a profit of 15 % per 200ml tub? (3)



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Total 18

QUESTION 2

The account below represents Mr. Peters water bill for the month of January. Some cells in the account have been left blank (Cells A, B, C, D). Calculate the answers to the following questions.

<b>ALBERTON MUNICIPALITY: Water Account</b>	
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Statement Date	15/02/2015	Account Number
Registered User	Mr. Jade Peters	346 972 9954

Street Address	3 Lotus Street Brackenrust Alherton
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Meter Reading				
Date Read	Meter no	Previous Reading	Current Reading	Consumption
28/01/2015	M 1428	2 578,55 kl	<b>A</b>	22,15 kl

Account Details	
Details	Amount Due
Water	<b>B</b>
VAT (14%)	<b>C</b>
<b>TOTAL DUE</b>	<b>D</b>

Current consumer final payment date 15/03/2015.  
Accounts in arrears after the 15<sup>th</sup> will be liable for disconnection.

Water Usage Summary		Tariff Structure	
Date	Meter Reading	Kilolitre	Tariff
December 2006	1 715 kl	< 6 kl	Free
November 2006	1 707 kl	6,1 – 15 kl	R5,91
October 2006	1 699 kl	15,1 – 25 kl	R6,43
		> 25 kl	R6,94

- 2.1) The reading on Mr. Peters's water meter last month was 2 578,55 kl and his consumption for this month was 22,15kl. Calculate and fill in the "Current Reading" (Cell A) (2)
- 2.2) Use the Tariff Structure table provided at the bottom of the bill to calculate the "Amount Due" by Mr. Peters for water. (Cell B) (4)
- 2.3) Calculate and fill in the VAT (value added tax) Mr. Peters will have to pay. (Cell C) (2)
- 2.4) If the Total Due is calculated by adding the amount due and the VAT, calculate and fill in the "Total Due" (Cell D) (2)

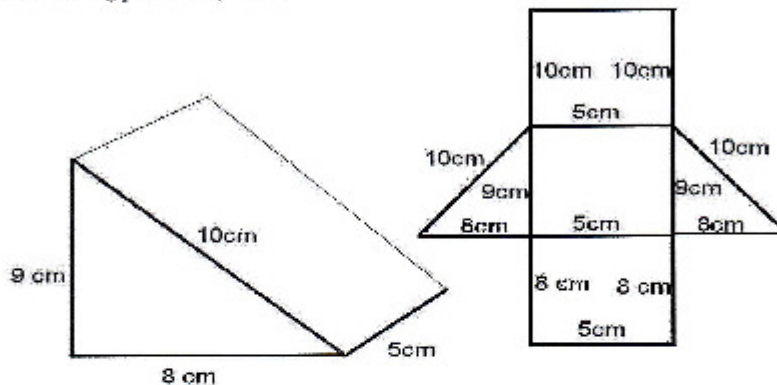
Total 10

Question 3

James has been tasked with the design and construction of a triangular shaped box for the packaging of small teddy bears that his entrepreneurship club intends selling on their schools Valentine's day. His teacher gives him the following formulae to help him with his construction:

$$V = \frac{1}{2} b \times h \times l ; A = l \times b ; A = \frac{1}{2} b \times h$$

Refer to the following plan to help James with his calculation:



- 3.1) Calculate the maximum volume that the box can hold. (3)
- 3.2) James wants to paint the outside of the box with red paint. Calculate the surface area of the box that needs to be painted. (note: only the outside of the box will be painted) (5)
- 3.3) One box requires 50ml of paint and one liter of red paint sells for R69.99. (3)
- 3.3.1) How many boxes can be painted with one liter of red paint? (3)
- 3.3.2) Calculate the cost of painting one box. Round your answer to two decimal places. (2)
- 3.4) The cost price of the finished product is worked out as follows: teddy bear is R10.98, box R1.75 and paint. (Use your answer from 3.3.2) If James wants to make a 25% profit, what should he sell his boxed teddy bears for? (3)

3.5) James recorded the amount of sales that he made on the day. He recorded the gender and the age of his customers. (M15 represents a 15 year old male; F12 represents a 12 year old female)

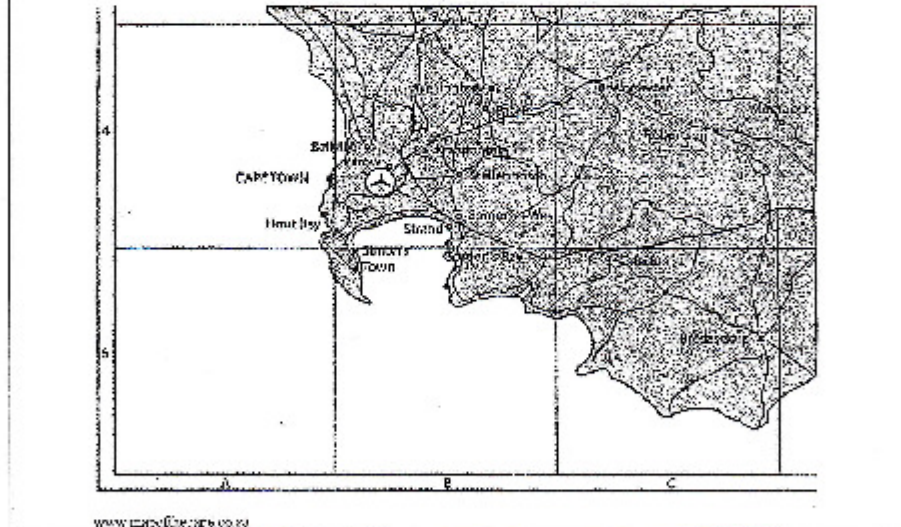
M 12	F 11	F 11	M 12	F 12	M 15	F 15	F 15	F 15	M 12
F 16	F 15	M 13	F 13	F 14	M 11	F 14	M 18	F 13	F 11
F 15	F 17	F 14	M 16	M 13	F 15	M 13	F 12	M 12	F 12
M 14	M 12	F 13	F 14	F 16	M 14	F 16	F 13	M 13	M 15

- 3.5.1) How many teddy bears did James sell on Valentine 's Day? (2)
- 3.5.2) Based on your calculation in question 3.4 , how much profit did James make in total? (2)
- 3.5.3) Calculate the mean age for all the females. All working out is to be shown. (3)
- 3.5.4) What is the modal age of the males. All working out is to be shown. (3)

Total 26

#### QUESTION 4

Mr and Mrs Jones are tourists from Canada who came to South Africa on holiday during December 2014. They stayed with friends in Caledon and visited all 17 towns indicated on the map of part of the Western Cape below.



Study the map and answer the questions that follow:

- 4.1) What is the grid reference for Hout Bay? (2)
- 4.2) What direction is the airport from Strand? (2)
- 4.3) Measure and record the shortest straight line distance in millimetres (mm) from Caledon to Bredasdorp. Convert your answer from mm to meters (m) (3)

- 4.4) Suppose the distance on the map from Stellenbosch to Caledon is 32 mm. What is the distance, in kilometres (km), if the scale of the map is given as 1:1 000 000? (3)
- 4.5) Long distances in South Africa used to be measured in miles where 1 km = 0,622 miles. A map shows the distance between Somerset West and Wellington as 50,4 miles. Convert this distance to kilometres. Write the answer correct to the nearest KILOMETRE. (3)
- 4.6) The Jones's intend staying in South Africa for 3 weeks. They have a budget of R3000 per day. The exchange rate is R9,54 = 1 Canadian Dollar.
- 4.6.1) Calculate the amount of Rand that their trip would cost them. (2)
- 4.6.2) How many Canadian Dollars would their trip to the Western Cape cost them? (3)

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Total 18

#### QUESTION 5

The following table shows the split times of an athlete during a half-marathon:

Leg	1	2	3	4	5
Distance	5 km	10 km	15 km	20 km	21,1 km
Split time	20 m 15 s	38 m 46 s	57 m 22 s	1 h 18 m 12 s	1 h 22 m 34 s

Now use the information in the table to answer the following questions:

- 5.1 If the race started at 6:55am, what was this athlete's finishing time? (3)
- 5.2 Compare the split time for leg 3 and leg 4. Help the athlete determine which leg was completed in the shorter time. (3)
- 5.3 What was the athlete's average running speed for the half-marathon? Express your answer in kilometers per hour. (3)
- (Hint:  $s = \frac{D}{T}$ )
- 5.4 Express your answer from 5.3 as hours and minutes. (2)

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Total 11

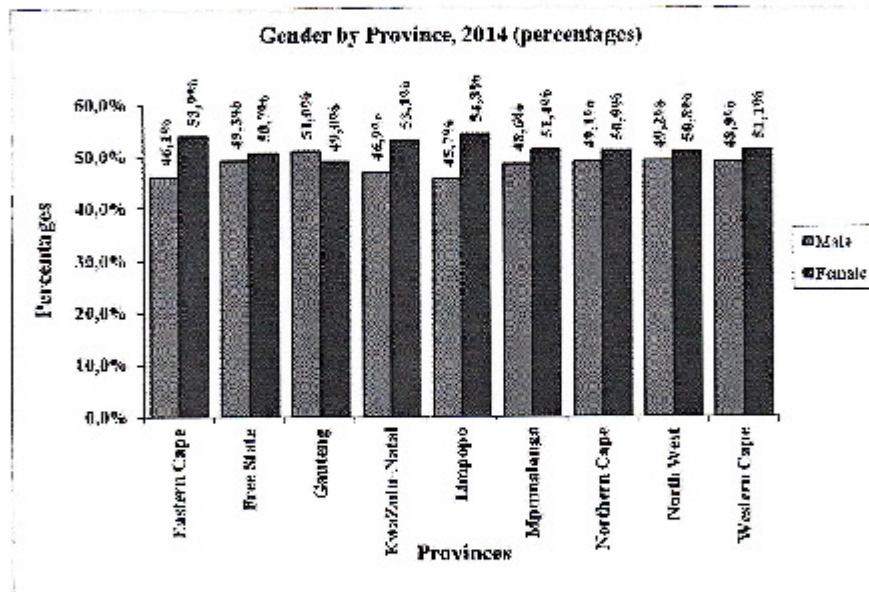
QUESTION 6

An official census is the official periodical collection of information about the size and characteristics of the population of a country. The 2014 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.

Note: Males are indicated on the left of the females for each bar.

Eg. Eastern Cape: Males 46.1%, Females 53.9%

Hint: To calculate how many males reside in Gauteng: 51% X 7 348 423 =



Total Population Figures

Eastern Cape	6 302 525
Free State	2 633 504
Gauteng	7 348 423
KwaZulu-Natal	8 417 021
Limpopo	4 929 568
Mpumalanga	2 800 711
Northern Cape	840 321
North West	3 354 825
Western Cape	3 956 875
TOTAL	40 583 573

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- 6.1 In which province was the percentage of males greater than the percentage of females? (Refer to the bar graph to answer this question.) (2)
- 6.2 In which province is there the greatest difference between the percentages of males and females? Determine the difference using a calculation. (Use the bar graph to answer this question.) (3)
- 6.3 Calculate the difference in the number of males in Gauteng compared to the number of males in KwaZulu-Natal. (Refer to the bar graph and the table to answer this question) (5)
- 6.4 What percentage of the total population of South Africa are males who live in the Northern Cape? (Refer to the bar graph and the table to answer this question) (3)
- 6.5 A person from the database of this census is chosen at random to represent South Africa as an ambassador at the 2015 Rugby World Cup final.
- 6.5.1 What is the probability that the person chosen is from Mpumalanga? (2)
- 6.5.2 What is the probability that the person chosen is NOT from the Western Cape? (2)

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Total 17

END