# HILLCREST HIGH SCHOOL

## Grade 11 Mathematical Literacy Exam
## Paper 1
## June 2014

Name: _____

MARKS: 75 TIME: 1 ½ hours

INSTRUCTIONS

1. Write your name and your teacher's name on your answer book.
2. This question paper consists of 5 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 Calculate the following:

1.1.1. $67 - (45 - 23)$ (1)

1.1.2. $2\frac{1}{2} \times 18{,}5 \times 14 + (23{,}2)^2$ (2)

1.1.3. $\sqrt{23^2 - 13^2}$ (2)

1.1.4. $1\frac{1}{4} + \frac{5}{18} + \frac{2}{9} + \frac{3}{12}$ (2)

1.1.5. $\frac{1}{8} + \frac{1}{4}\ of\ 1\frac{1}{2}$ (2)

1.2 Split R684 000 between 3 business partners in the ratio of 1:2:6. (4)

1.3 A baker makes boxes of biscuits. Each box has 18 biscuits in it.
How many boxes can she prepare if she has baked a batch of 500 biscuits? (3)

1.4 Eggs can be sold in trays of 30 eggs per tray.

1.4.1. How many trays of eggs would need to be bought if 370 eggs are required to make omelettes for a charity breakfast? (3)

1.4.2. How many omelettes could be made if each omelette requires approximately 1 and a half eggs? (3)

1.5 A winter's day in Welkom in the Free State had a lowest temperature of -7 ºC and a highest temperature of 11 ºC. Calculate the difference between the highest and lowest temperatures for that day. (2)

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QUESTION 2

The two Voyager space probes were launched in 1977 with the aim of exploring the planets in our Solar System. They have sent detailed images of the planets and some of their moons back to Earth.

2.1 Signals from the probe take 13,5 hours to reach Earth from a distance of 16 billion kilometers. How many seconds are there in 13,5 hours? (2)

2.2 When the probe was taking pictures of the planet Neptune, it sent them back to Earth via a radio signal. The signal took approximately 9 000 seconds to reach Earth. Neptune is approximately 2 720 000 000 km from Earth. How many km does a radio wave travel in 1 second? (Answer to the nearest km). (2)

2.3 Round your answer in question 2.2 to the nearest hundred thousand kilometers. (1)

2.4 The Earth has a circumference of approximately 40 000 km. Using your answer from question 2.3, how many times could a radio wave go around the Earth in 1 second? (If it could bend around the Earth of course!) (2)

2.5 An image appeared in *Time Magazine* that shows a comparison between the size of an average man and the Voyager probe.

2.5.1 The man in the picture measured 6 mm and the antenna dish of the probe measured 18 mm. Write these values as a ratio. (2)

2.5.2 The average man is 1,7 m tall. Use your ratio from question 2.5.1 to calculate the height of the antenna dish. (2)

2.6 This large antenna sends and receives signals to and from the Earth. It uses 24 Watts of power. A normal refrigerator bulb uses 40 Watts.

2.6.1 Write the antenna power as a fraction of a refrigerator bulb power. Don't forget to simplify. (1)

2.6.2 Write the antenna power as a percentage of a refrigerator bulb power. (2)

[14]

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QUESTION 3

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:

3.1 If the race started at 6:35am, what was this athlete's finishing time? (2)

3.2 Which of the first four legs was covered in the shortest time? (4)

3.3 What was the athlete's average running speed for the half-marathon?

(Hint: $s = \frac{D}{T}$) (3)

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QUESTION 4

4.1 The account below represents Mrs Ntuli's 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.

**CAPE TOWN MUNICIPALITY: Water Account**

| | |
|---|---|
| Statement Date | 15/02/2007 |
| Registered User | Mrs Mwanza Ntuli |

| |
|---|
| Account Number |
| 2301671 |

| | |
|---|---|
| Street Address | 39 Boom Street<br>Retreat |

| **Meter Reading** | | | | |
|---|---|---|---|---|
| **Date Read** | **Meter no** | **Previous Reading** | **Current Reading** | **Consumption** |
| 28/01/2007 | M 1428 | 1 715 kl | **A** | 23,15 kl |

| **Account Details** | |
|---|---|
| **Details** | **Amount Due** |
| Water | **B** |
| VAT (14%) | **C** |
| TOTAL DUE | **D** |

Current consumer final payment date 15/03/2007.
Accounts in arrears after the 15th will be liable for disconnection.

| **Water Usage Summary** | |
|---|---|
| **Date** | **Meter Reading** |
| December 2006 | 1 715 kl |
| November 2006 | 1 707 kl |
| October 2006 | 1 699 kl |

| **Tariff Structure** | |
|---|---|
| **Kilolitre** | **Tariff** |
| ≤ 6 kl | Free |
| 6,1 – 15 kl | R5,91 |
| 15,1 – 25 kl | R6,43 |
| > 25 kl | R6,94 |

4.1.1 The reading on Mrs Ntuli's water meter last month was 1 715 kl and her consumption for this month was 23,15 kl. Calculate and fill in the "Current Reading" (Cell A) (1)

4.1.2 Use the Tariff Structure table provided at the bottom of the bill to calculate the "Amount Due" by Mrs Ntuli for water. (Cell B) (3)

4.1.3 Calculate and fill in the VAT (value added tax) Mrs Ntuli will have to pay. (Cell C) (2)

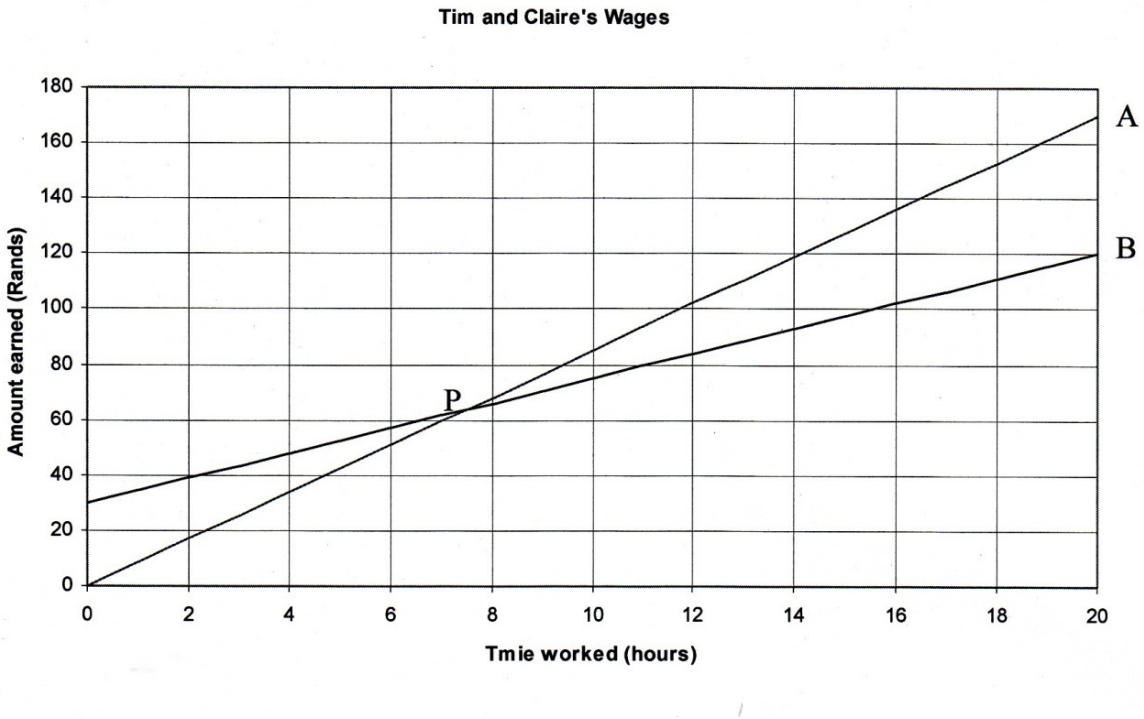
4.1.4 If the Total Due is calculated by adding the amount due and the VAT, calculate and fill in the "Total Due" (Cell D) (1)

[7]

QUESTION 5

Claire and Tim both work at restaurants to earn some pocket money. Tim works at *Tata Africa*. He gets paid R8,50 per hour. Claire works at *Van Schalkwyk's Tavern*. She gets paid R30 a week basic pay and an additional R4,50 per hour.

The graphs below show Claire and Tim's wages in one week.




5.1 Which line represents Tim's wages? A or B? Explain your answer. (2)

5.2 If Tim and Claire both worked for 4 hours in a week, who would earn more? (3)

5.3 What does the point P on the graph represent? (1)

5.4 From your graph read off the approximate coordinates of P. (2)

5.5 Use W to represent wages and t to represent time worked and write two equations to represent the wages of Tim and Claire in the form W = … (4)

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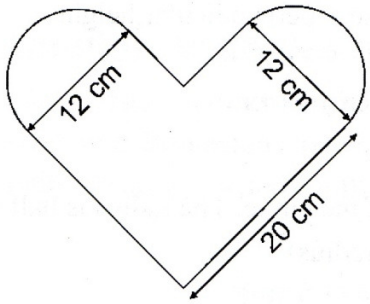
QUESTION 6




6.1 Calculate the perimeter of the above heart shape. (4)

6.2 Calculate the area of the above heart shape. (5)

[9]

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**Total 75**