HILLCREST HIGH SCHOOL

Grade 12 Mathematical Literacy Exam
Paper 2
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

Sandile Shabala is a businessman who visits various capital cities in Africa.
The table below shows the exchange rate between eleven African currencies, United States dollar (US$) and the South African Rand (ZAR).

CURRENCY	AMOUNT IN US$	AMOUNT IN ZAR
1 Algerian dinar	0,013592	0,10380
1 Angolan kwaza	0,010524	0,08160
1 Botswana pula	0,136131	1,05500
1 Egyptian pound	0,165683	1,28500
1 Ghanaian cedi	0,568235	4,41000
1 Kenyan shilling	0,012040	0,09340
1 Mozambican metical	0,036394	0,00030
1 Malawian kwacha	0,006009	0,04665
1 Nigerian naira	0,006345	0,04925
1 South African Rand	0,128990	1,00000
1 Zambian kwacha	0,000189	0,00150

1.1.1 Which country had an exchange rate of US$ 0,012040 to ONE unit of its currency? (2)

1.1.2 Which of the currencies above gives you the largest amount in US$ for ONE unit of the currency? (2)

1.1.3 Sandile's accommodation in Zambia costs 25 976,87 kwahca. Convert this amount to US$. (2)

1.1.4 Sandile bought goods in Ghana to the value of 1345 cedi. Calculate the value, in rand, of the goods Sandile bought. (2)

1.2 Aiden's company collected information during 2015 relating to the cost of producing television advertisements. The company released the following information:

* 640 advertisements were produced in 1760 shoot days*
* 219 of the advertisements were produced in high definition**
* The average cost of producing an advertisement is R1 349 531.

*A shoot day refers to the number of regulated working hours per day to film an advertisement.
**High definition pictures are of a better quality than ordinary pictures.

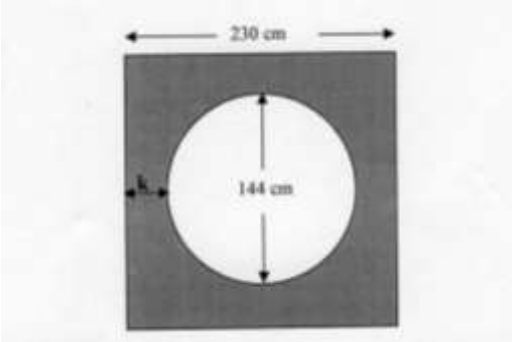
1.2.1 Calculate the average number of shoot days it takes to produces ONE advertisement.(2)

1.2.2 Calculate the total cost of producing advertisements in high definition if the cost per advertisement is the same as the average cost. (2)
1.2 3 Determine how many advertisements were NOT produced in high definition. (2)

1.2.4 In 2015, the hiring cost of equipment used for the filming of one television advertisement was 16% of the cost of producing the advertisement. Calculate the hiring cost during 2015. (2)

1.2.5 The average cost of producing an advertisement in 2015 was 40% more than the average cost of producing an advertisement in 2010.
Calculate the average cost of producing an advertisement during 2010. (3)

1.3 Mr Stirling installed a circular window in the centre of a square wall, as shown in the diagram below. He intends painting the wall.



The diameter of the circular window is 144cm.
The length of each side of the square wall is 230cm.
The shortest distance between the edge of the window and the edge of the wall is shown as K in the sketch.

1.3.1 Determine the length of the radius of the window. (2)

1.3.2 Determine the value of k in centimeters. (3)

1.3.3 Calculate the circumference of the window. Use $\pi = 3{,}14$. (2)

CIRCUMFERENCE = π x d

1.3.4 Calculate the area of the wall he needs to paint.

Use the formulae :

AREA OF CIRCLE = π x r^2

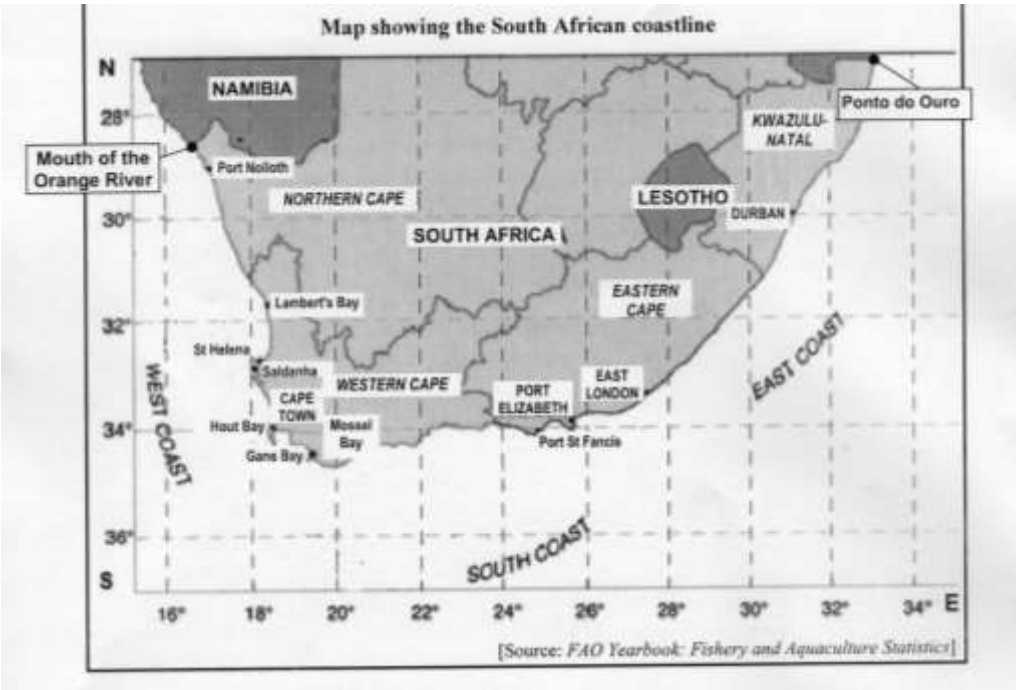
AREA OF SQUARE = s^2

r = radius of the circle and s = length of the side of the square. Use $\pi = 3{,}14$ (4)

[30]

Question 2

2.1 The South African coastline measures approximately 2798km from the mouth of the Orange River on the West Coast to Ponta do Ouro in Mosambique on the East Coast. The Eastern Cape has approximately 880km of coastline. The map below shows the coastline of South Africa.

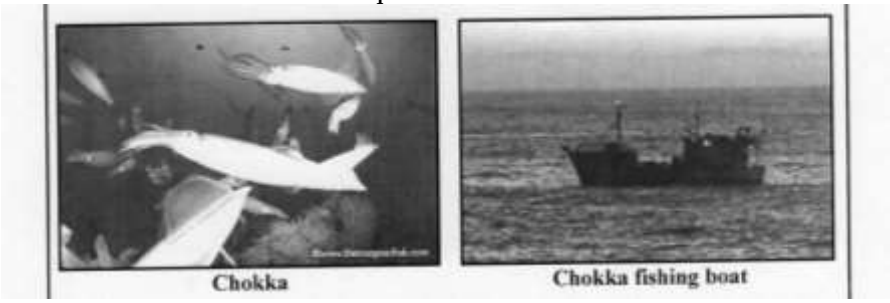


2.1.1 Determine the total length, in miles, of the South African coastline of the coastline of the Eastern Cape is approximately 500 miles long. (3)

2.1.2 Use the map to list the coastal provinces of South Africa in descending order according to the length of their coastlines. (3)

2.1.3 Harley measured the length of the coastline of South Africa on her map and found it to be 22,3cm long.
Determine the scale of the map in the form 1 : ……
Round off the answer to the nearest hundred thousand. (4)

2.2 One of the big fishing industries in the Eastern Caper is the chokka industry. Chokka is the South African name for squid or calamari.


Chokka

Chokka fishing boat

The fishing industry is regulated by the Department of Agriculture, Forestry and Fisheries. They issue permits to people catching chokka along the South African coastline. Chokka is caught from fishing boats of different sizes, as summarised in the table below.

TYPE	LENGTH (IN METRES)	RECOMMENDED NUMBER OF CREW MEMBERS *
Ski Boat	6 to 8	6 to 10
Deck boat	8 to 18	10 to 24
Small freezer boat	10 to 13	12 to 14
Medium freezer boat	13 to 15	14 to 22
Large freezer boat	15 to 20	24 to 32

*Crew members are all the people who work on a boat.

Mr. Hopkins decides to employ the maximum number of crew members for each boat.

2.2.1 Mr Hopkins own 3 ski boats, 1 small freezer boat and 2 medium freezer boats. Calculate the maximum number of crew members in total he would need for his fishing boats. (3)

2.2.2 The Department of Agriculture, Forestry and Fisheries informed Mr Hopkins that he will receive 102 chokka fishing permits for 2017. According to regulations, each crew member on a chokka boat must have a fishing permit. Mr Hopkins realizes that he will now be able to increase his number of fishing boats.
Which ONE of the types of fishing boats in the table above would exactly suit his needs in 2017? Justify your answer. (4)

2.3 Once caught, the chokka is placed in a freezer which cools it down at a constant rate of 14,5°C per hour until it reaches a minimum temperature of -14,5°C.

A chest freezer used to freeze the chokka

Assume that the temperature of the chokka is 18°C when caught. The temperature of the chokka as it cools down can be calculated using the formula below:

TEMPERATURE IN °C = $18 - (14{,}5 \times \frac{time\ in\ minutes}{60})$

The table below shows the change in the temperature of the chokka over a period of time.

Time (in minutes)	0	E	120	180	240	360
Temperature (in ℃)	18	0	D	-22,5	-40	-40

2.3.1 Calculate the missing vales for D and E. (5)

2.3.2 Use the table to draw a line graph on the grid on ANNEXURE 1 at the back of your answer booklet. (5)

2.3.3 One of the crew members claims that the freezer cools down the chokka at a constant rate of 2,42°C for every 10 minutes.
Verify, showing ALL calculations, whether this claim is valid. (3)

[30]

Question 3

3.1 Mr. Moore is 27 years old and obtained his driver's license when he was 25 years of age. He was involved in a car accident recently. He had to ask for a quotation from the panel beaters in order for his insurance company to reimburse him for the damages on his car.

See the quotation of L.A. Panel on ANNEXURE A and answer the questions that follow.

3.1.1 Complete the quotation by calculating the values for A, B, C and D. (5)

3.1.2 The profit on the parts is calculated at 25%. What is the cost price of all the parts needed to repair Mr. Moore's car? (3)

3.2 All insurance companies require that clients pay an excess amount directly to the panel beater.

* This is calculated at 5% of the quotes amount, but with a minimum of R1500
* In addition to that, the insurance company charges an extra R500 if the driver of the vehicle is under the age of 25.
* R500 penalty is added if the licence was obtained less than 3 years ago.

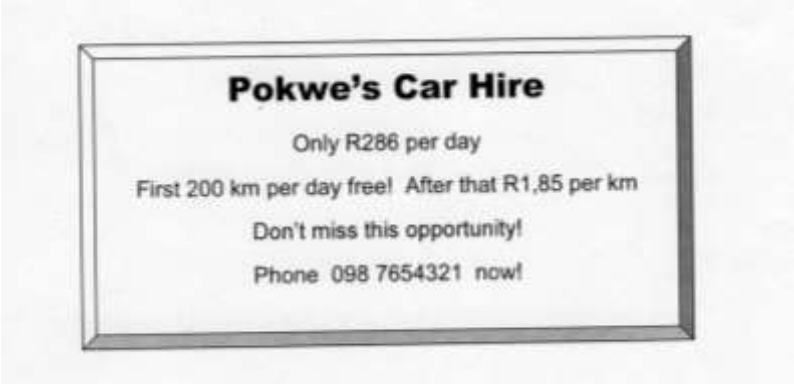
3.2 1 How much would Mr. Moore's excess amount be? (6)

3.2.2 Calculate the amount that the insurance company will have to pay L.A. Panel to repair Mr. Moore's vehicle after he paid the excess amount. (2)

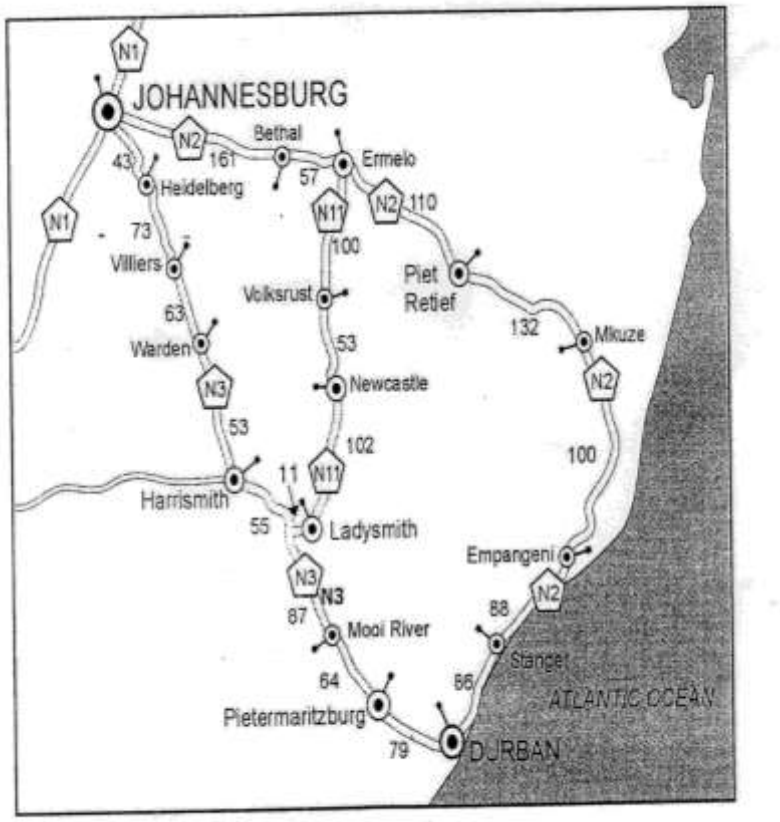
3.3 If the repair costs are too much, the insurance company will not approve the payment reparation. They base their decision on 75% of the average between the trade-in-value and the retail value of the car involved. Mr. Moore owns a 1997 Ford Lazer Tracer. The trade-in-value of the car is R24 000 and the retail value of the car is R31 000.

Show, with calculations, whether the insurance company will approve the fact that Mr. Moore's car can be fixed. Give a reason for your answer. (7)

3.4 L.A. Panel has courtesy cars available for clients whose cars are being repaired. Unfortunately all their courtesy cars are out at the moment and they will only have one available in three days' time. Mr. Moore decides to rent a car for the three days until he can get a courtesy car. He sees the following advertisement :



3.4.1 Complete the table on the sheet at the back of your answer booklet (ANNEXURE 2) in order to calculate the total cost of renting a car for three days. Use the map below to determine the distances travelled.



[From: *AA online maps Pretoria/Johannesburg to Durban*]

- Mr. Moore stays in Villiers and travels to Heidelberg and back on the first day that he rented a car.
- On the second day he had to go to Johannesburg and returned home late that afternoon
- On the third day, he went to Warden to visit his sister before he went home again. (12)

3.4.2 In which direction will Mr. Moore be travelling if he drives from Villiers to Warden?(2)

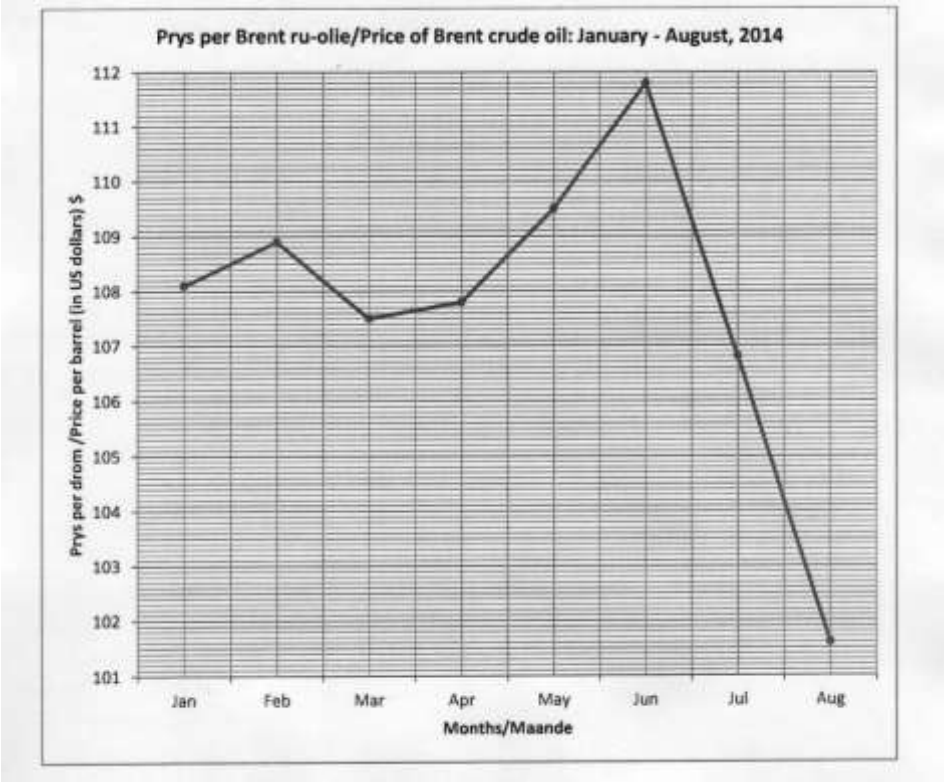
[37]

Question 4

4.1 Monthly petrol prices (in cents per litre) in South Africa for the period 2013 -2014 are given in the table below.

Petrol price in cents: 2014 - 2013					
	Inland	Coast		Inland	Coast
	LRP	LRP		LRP	LRP
2014	**93**	**95**	**2013**	**93**	**95**
6 August 2014	1408	1392	7 August 2013	1332	X
2 July 2014	1408	1392	3 July 2013	1300	1286
4 June 2014	1379	1361	5 June 2013	1216	1202
7 May 2014	1401	1383	1 May 2013	1224	1210
2 April 2014	1416	1398	3 April 2013	1297	1283
5 March 2014	1411	1395	6 March 2013	1287	1273
5 February 2014	1375	1359	6 February 2013	1206	1192
1 January 2014	1336	1357	2 January 2013	1165	**1151**

Below is a graph that shows the monthly prices in US Dollars per barrel of Brent crude oil in 2014. (1$ - R12,80).



Use the information in the table and graph above to answer the following questions.

4.1.1 Give the price of 93 LRP petrol of the inland region on 6 March 2013 in South African Rand (ZAR). (2)

4.1.2 Determine the maximum price of a barrel of Brent crude oil, in Rand, in February 2014. (3)

4.1.3 If the maximum price of 95 LRP increased by 14,51% between January and August 2013, calculate the value of X in the table. (3)

4.1.4 Describe any TWO trends between the price of Brent crude oil and that of 95 LRP at the coast, for the period January to August 2014. (2)

4.2

This is an extract from a newspaper article on28th August 2014 :

'The price of Brent crude oil in August was down with 8 percent compared to June.'

Use the information in this extract together with the table and the graph to answer the following questions.

4.2.1 Write down (in US dollars) :

4.2.1.1 The maximum price of Brent crude oil in June 2014 (2)

4.2.1.2 The minimum price of Brent crude oil in August 2014. (2)

4.2.2 Is the newspaper article statement correct?
Justify your answer showing ALL necessary calculations. (4)

4.3 A cylindrical barrel (drum) contains 42 gallons of oil. The diameter of this barrel is 18 inches. You may use the following information:

PICTURE OF A BARREL/DRUM:

1 gallon = 3,78541 litres
1 inch = 2,54 cm
1ml = 1 cm^3

Volume = π x r^2 x h let π = 3,142

Area of a circle = π x r^2

Surface area of a cylinder with a closed lid and base = (2 x π x r^2) + (2 x π x r x h)

4.3.1 Determine the radius of the barrel (drum) in centimeters. (3)

4.3.2 Show, by calculations, that the height of the barrel of oil is 96,82cm. (5)

4.3.3 Using 4.3.2, calculate the surface area of this barrel in m^2. (5)

[31]

Question 5

5.1 The cost of electricity has increased dramatically over the past two years. Individual households are charged according to the number of kilowatt-hours (kWh) of electricity used. Households using more electricity are charged at a higher rate per kWh than those using less electricity

Use the table below to answer the questions that follow :

The average monthly increase in the cost of electricity (excluding VAT) between 2014 and 2015

	Average monthly usage in kWh				
	50	**150**	**600**	**1 000**	**1 500**
Amount payable in 2014	R27,35	R85,83	R393,67	R728,63	R1 147,33
Amount payable in 2015	R28,83	R94,99	R467,43	R888,83	**C**
Increase between 2014 and 2015	R1,48	R9,16	**A**		
Percentage increase between 2014 and 2015	5,39%	10,67%	18,74%	**B**	23,38%

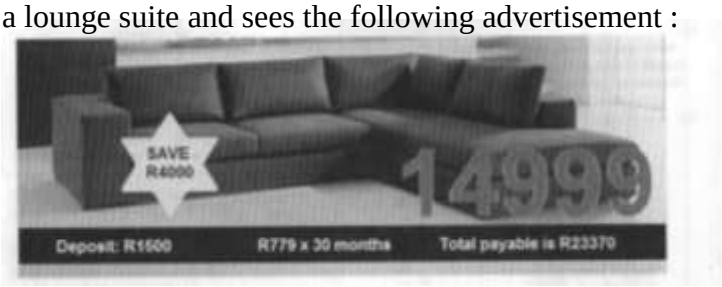
5.1.1 During 2015 the Matthews family used an average of 600kWh per month while the Shaik family used and average of 150kWh per month. Use the table to calculate the difference in cost per kWh that the Matthews and Shaik families had to pay. (5)

5.1.2 The difference in cost of electricity can be viewed by some customers as fair and by others as unfair. Give a suitable reason for each of these views. (2)

5.1.3 Calculate the missing values A, B and C in the table showing ALL working out. (6)

5.1.4 Mrs. Cole used an average of 1000kWh of electricity per month. Calculate the total annual increase, including VAT, of her electricity bill between 2014 and 2015.
(USE VAT = 14%) (4)

5.2 Kira is buying a lounge suite and sees the following advertisement :



Kira does not have enough cash to purchase the lounge suit so is interested in the payment terms offered by the shop.

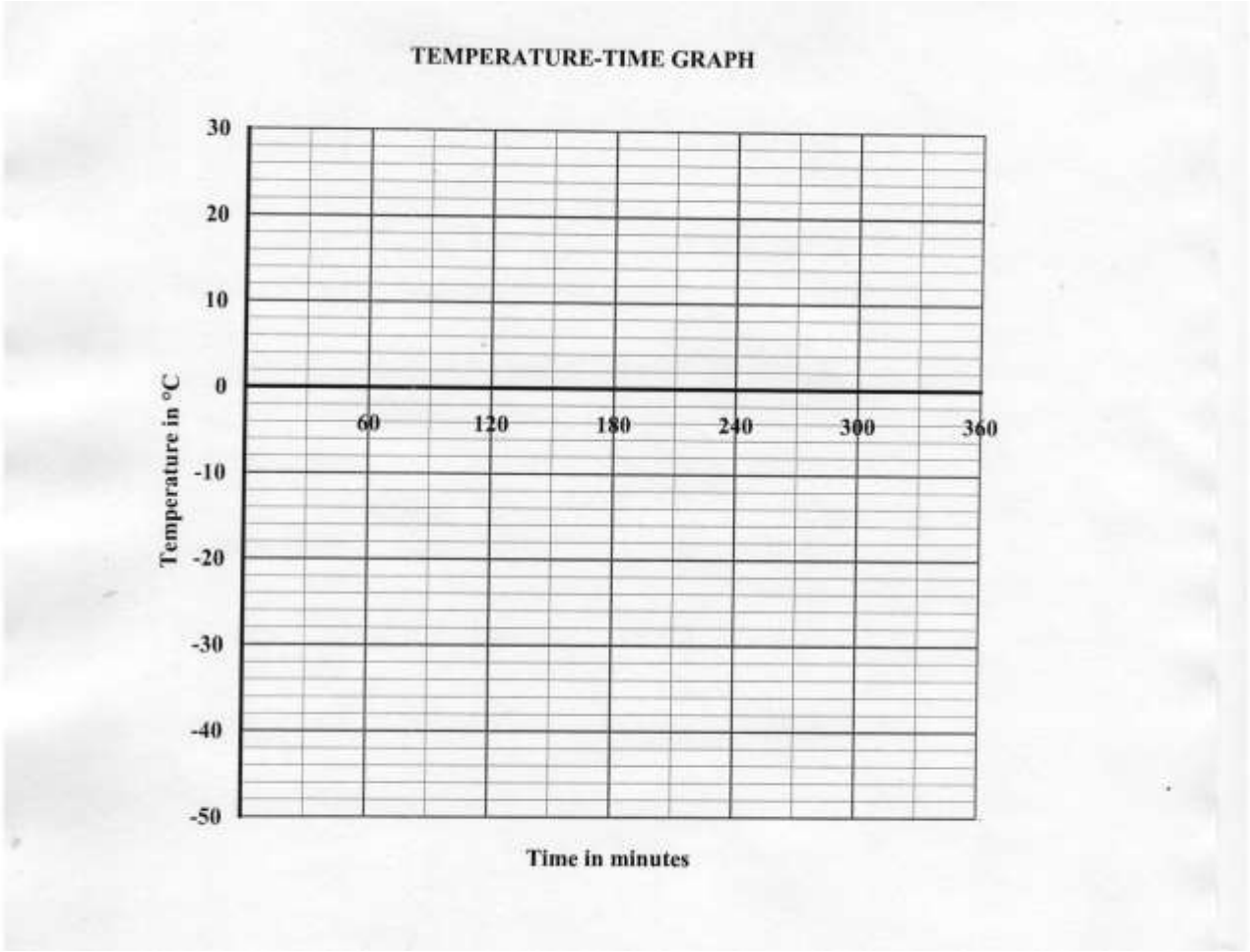
5.2.1 Does the **Total Payable** amount include your deposit? Substantiate your answer. (Show by calculations) (3)

5.2.2 If Kira buys this lounge suit on hire purchase, how much extra (in rands) does she end up paying? (2)

[22]

ANNEXURE 1

QUESTION 2.3.2



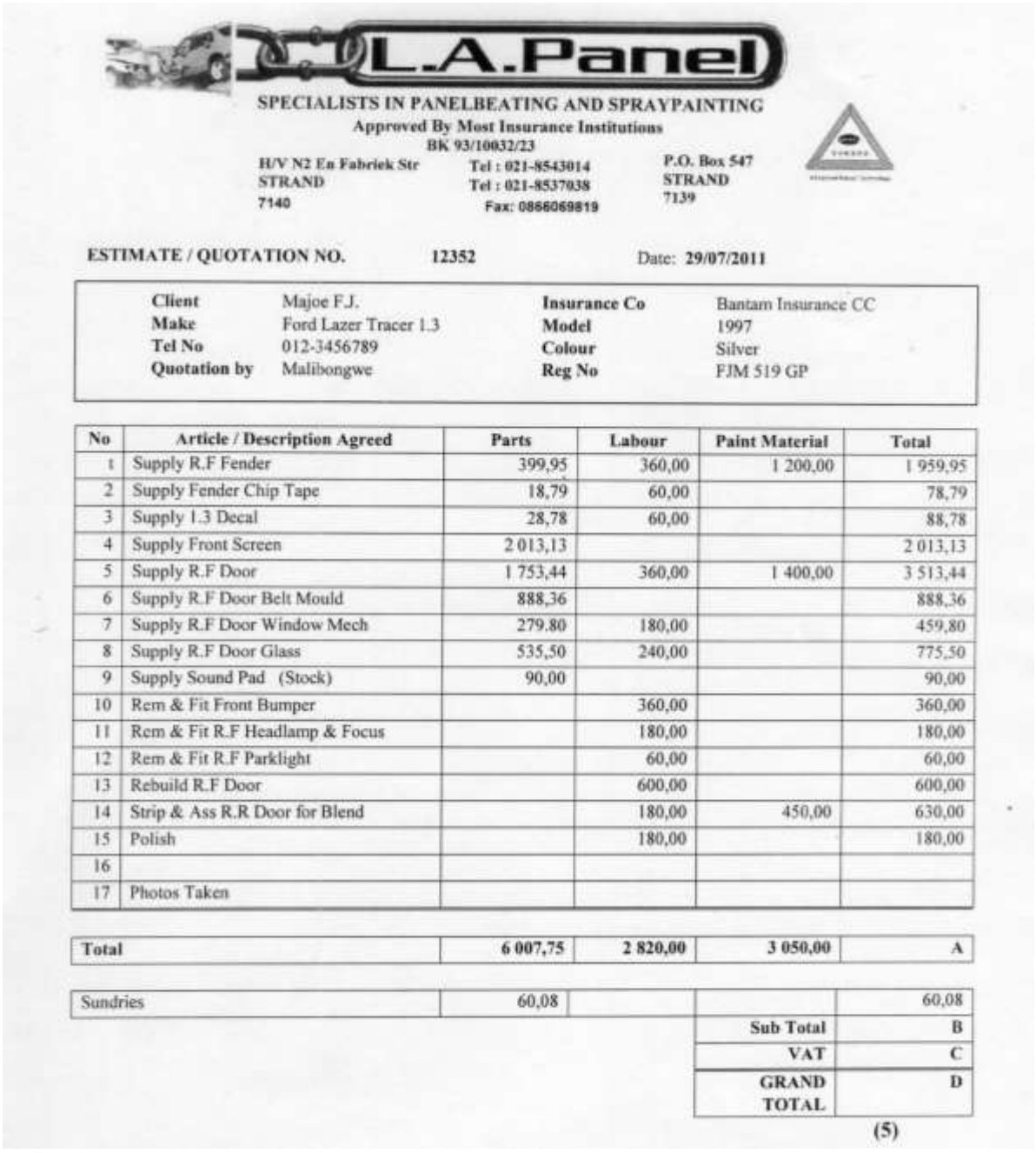
ANNEXURE 2

QUESTION 3.4.1

DAY	Fixed Cost per Day	Total Distance	Travel Cost	Total Cost
1	R286		Free	
2	R286			
3	R286	$63 \times 2\ km$ $= 126\ km$		R286
Mr Majoe's Total Cost to rent a car for 3 days				

(12)

ANNEXURE A – QUESTION 3



L.A.Panel

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STRAND
7139

ESTIMATE / QUOTATION NO. 12352 Date: **29/07/2011**

Client	Majoe F.J.	**Insurance Co**	Bantam Insurance CC
Make	Ford Lazer Tracer 1.3	**Model**	1997
Tel No	012-3456789	**Colour**	Silver
Quotation by	Malibongwe	**Reg No**	FJM 519 GP

No	Article / Description Agreed	Parts	Labour	Paint Material	Total
1	Supply R.F Fender	399,95	360,00	1 200,00	1 959,95
2	Supply Fender Chip Tape	18,79	60,00		78,79
3	Supply 1.3 Decal	28,78	60,00		88,78
4	Supply Front Screen	2 013,13			2 013,13
5	Supply R.F Door	1 753,44	360,00	1 400,00	3 513,44
6	Supply R.F Door Belt Mould	888,36			888,36
7	Supply R.F Door Window Mech	279.80	180,00		459,80
8	Supply R.F Door Glass	535,50	240,00		775,50
9	Supply Sound Pad (Stock)	90,00			90,00
10	Rem & Fit Front Bumper		360,00		360,00
11	Rem & Fit R.F Headlamp & Focus		180,00		180,00
12	Rem & Fit R.F Parklight		60,00		60,00
13	Rebuild R.F Door		600,00		600,00
14	Strip & Ass R.R Door for Blend		180,00	450,00	630,00
15	Polish		180,00		180,00
16					
17	Photos Taken				
Total		**6 007,75**	**2 820,00**	**3 050,00**	**A**
Sundries		60,08			60,08
				Sub Total	**B**
				VAT	**C**
				GRAND TOTAL	**D**

(5)

USE VAT = 14%