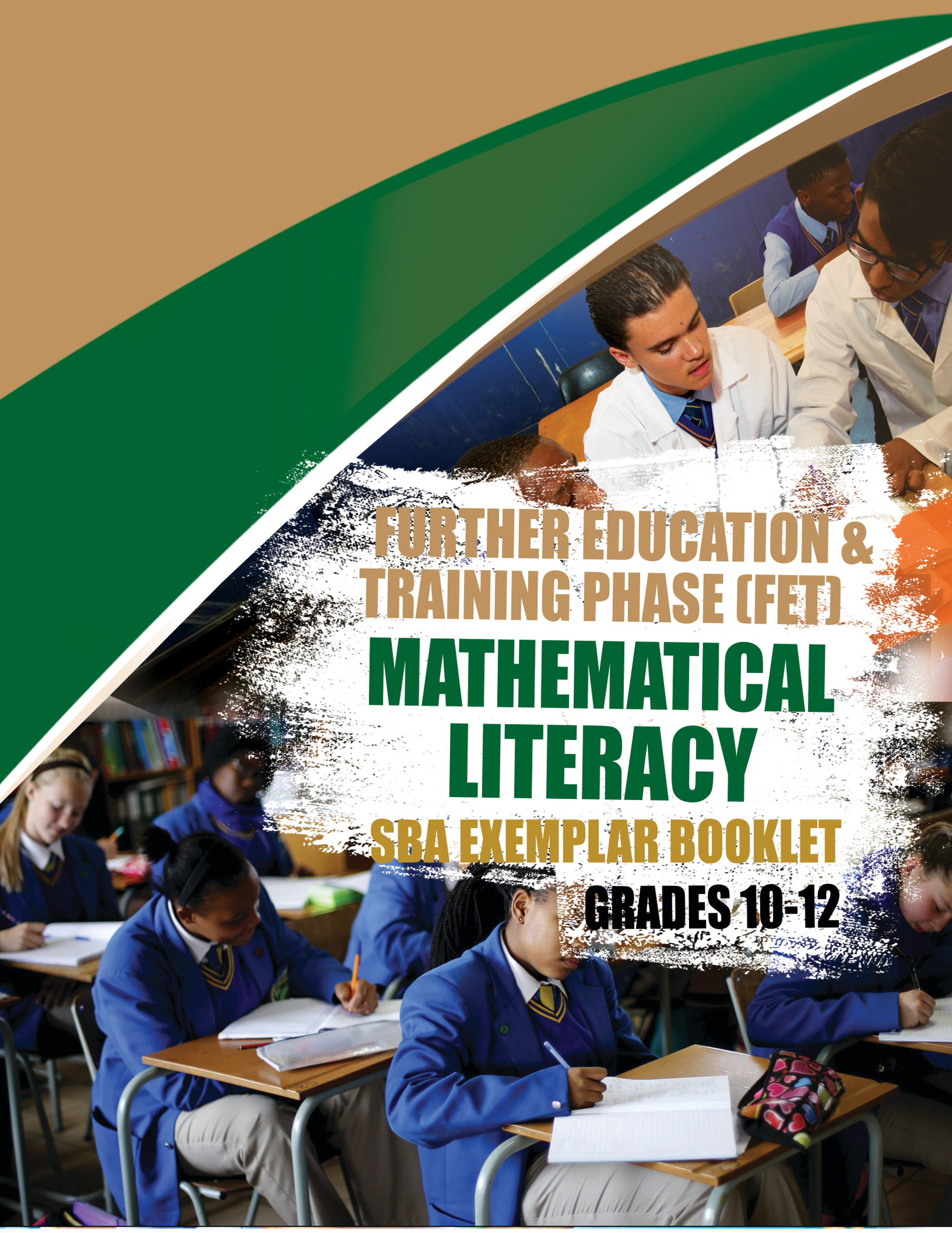


FURTHER EDUCATION & TRAINING PHASE (FET)

MATHEMATICAL LITERACY

SBA EXEMPLAR BOOKLET

GRADES 10-12

basic education
Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

Read to Lead
A Reading Nation is a Leading Nation

2030 NDP

FOREWORD

The Department of Basic Education has pleasure in releasing a subject exemplar booklet for School Based Assessment (SBA) to assist and guide teachers with the setting and development of standardised SBA tasks and assessment tools. The SBA booklets have been written by teams of subject specialists to assist teachers to adapt teaching and learning methods to improve learner performance and the quality and management of SBA.

The primary purpose of this SBA exemplar booklet is to improve the quality of teaching and assessment (both formal and informal) as well as the learner's process of learning and understanding of the subject content. Assessment of and for learning is an ongoing process that develops from the interaction of teaching, learning and assessment. To improve learner performance, assessment needs to support and drive focused, effective teaching.

School Based Assessment forms an integral part of teaching and learning, its value as a yardstick of effective quality learning and teaching is firmly recognised. Through assessment, the needs of the learner are not only diagnosed for remediation, but it also assists to improve the quality of teaching and learning. The information provided through quality assessment is therefore valuable for teacher planning as part of improving learning outcomes.

Assessment tasks should be designed with care to cover the prescribed content and skills of the subject as well as include the correct range of cognitive demand and levels of difficulty. For fair assessment practice, the teacher must ensure that the learner understands the content and has been exposed to extensive informal assessment opportunities before doing a formal assessment activity.

The exemplar tasks contained in this booklet, developed to the best standard in the subject, is aimed to illustrate best practices in terms of setting formal and informal assessment. Teachers are encouraged to use the exemplar tasks as models to set their own formal and informal assessment activities.

MR HM MWELI

DIRECTOR-GENERAL

DATE: 13/09/2017

Table of Contents

1. Introduction

Assessment in the National Curriculum Statement Grades R – 12 comprises School-Based Assessment for subjects offered in the Further Education and Training Phase (and Practical Assessment Tasks for certain subjects) and a final end-of-year examination.

School-Based Assessment is designed to address the content competencies, skills, values and attitudes of the subject, and to provide learners, parents and teachers with results that are meaningful indications of what the learners know, understand and can do at the time of the assessment.

School-Based Assessment allows for learners to be assessed on a regular basis during the school year and also allows for the assessment of skills that cannot be assessed in a written format, e.g. test or examination. This assessment is a compulsory component for progression and promotion in all the different school phases and includes a variety of assessment methods as contemplated in Chapter 4 of the Curriculum and Assessment Policy Statements. Moderation should ensure that the quality and standard of the School Based Assessment, as contemplated in Chapter 4 of the Curriculum and Assessment Policy Statements, have been met.

2. Aims and objectives

The purpose of this document is to provide both teachers and learners with a set of quality-assured SBA tasks. This document was also developed with an intention to engage Provincial Education Departments (PEDs) on aspects to be considered when capacitating their teachers on the setting of quality SBA tasks.

This document provides exemplar tasks that are reflecting the depth of Mathematical Literacy curriculum content appropriate for Grades 10, 11 and 12. Every effort has been taken to ensure that the distribution of marks in the tasks is in accordance with the cognitive levels of the taxonomy used in the Mathematical Literacy CAPS document.

3. Assessment Tasks

The exemplar tasks in this booklet include *Assignments* and *Investigations* for Grade 10 - 12. When the Department of Basic Education (DBE) embarked on a nationwide moderation process of SBA tasks, it was discovered that many schools across the country do not follow the requirements and guidelines when setting investigations and assignments. The provincial moderation processes were found to be biased more towards written tests and examinations,

hence discrepancies with respect to quality in investigations and assignments on the one hand and written tests and examinations on the other.

In the context of Mathematical Literacy, an assignment is a well-structured task with clear guidelines and a well-defined outcome. An assignment could provide learners with the opportunity to consolidate a topic or section that has been covered in class, or to apply an approach or method studied in class to a new context, or to revise for tests and/or examinations. Both the content and contexts of the assignment are likely to be familiar to the learner. While the teacher may allocate classroom time to an assignment and supervise the completion, parts of an assignment should also be completed by the learner in his or her own time and/or with the assistance of other learners.

On the other hand, an investigation involves a guided discovery, where learners are led through a process of discovering a particular concept or idea through leading questions. This guided discovery may include the collection of data and/or information to solve a problem.

It is anticipated that PEDs will continue to support schools in the quality assurance of written tests and examinations as a supplement to this document.

4. Quality Assurance Process

It has come to the attention of the Department that there are different moderation practices across provinces and that evidence of moderation of all SBAs and in all Grades is not always available. As such, SBA items in schools are often not compatible with the NSC examination items. Whilst the quality assurance process would involve meeting set standards on a number of criteria, it has been established that there are two main aspects that compromise the quality of tasks in Mathematical Literacy, namely, Context and Language. More focus was placed on these aspects when the tasks were quality assured.

Mathematical Literacy is focused on real context, or at most cleaned context. No contrived context is permissible in the subject. Furthermore, as stated in the Mathematical Literacy CAPS document, 'familiar/unfamiliar' context is to be interpreted in two different ways. Familiar/Unfamiliar with respect to:

- learners' lived experiences (where familiar means learners likely to have had exposure to the context and unfamiliar means learners unlikely to have had exposure to the context (i.e. an experience that has not been lived)
- contexts listed in the CAPS (where familiar refers to those contexts listed in the CAPS and unfamiliar refers to those contexts not listed in the CAPS)

Familiar/Unfamiliar with respect to learners' lived experiences directly influences PROGRESSION in the subject. That is, contexts that are potentially closer to the lived experiences of learners are dealt with in Grade 10; but by Grade 12 the contexts are expanded to cover those that are unfamiliar to the learners' lived experiences.

On the other hand, it is familiar/unfamiliar with respect to contexts listed in the CAPS that directly affect ASSESSMENT. For instance:

Paper 1 is restricted to 'familiar' contexts → i.e. those contexts prescribed in CAPS.
Paper 2 may contain 'unfamiliar' contexts that are not listed in the CAPS.

The argument here is that including lots of information in contextual scenarios of the tasks does not necessarily increase the taxonomy level complexity of a question. Instead, it makes the context less accessible, which means that learners are not able to access the questions, because they have not been able to interpret the information or the language or the words (and not because they do not understand the concept/skill that is being assessed in the question). It has therefore to be ensured that information is, at all costs, presented in such a manner that it is accessible so learners are given a fair chance to attempt the questions without having to be at a disadvantage because their reading or language skills are not strong.

The quality assurance process of the tasks in this document was in the main influenced by issues raised above. This document is a product of DBE coordinated SBA workshops wherein Mathematical Literacy provincial officials were provided with draft SBA tasks (as working documents) to quality assure and redesign to meet the set standards. As far as circumstances permitted, it was ensured that provinces did not work on their own drafts. The process was thus serving as a capacity building initiative as well.

5. Cognitive levels in Mathematical Literacy

Every effort was taken to ensure that all tasks comply, as much as possible, with the following distribution of marks according to the levels of the Mathematical Literacy taxonomy in formal assessment tasks:

Cognitive Levels	Percentage allocation
Level 1: Knowing	30% ± 5%
Level 2: Applying routine procedures in familiar contexts	30% ± 5%
Level 3: Applying multi-step procedures in a variety of contexts	20% ± 5%
Level 4:Reasoning and reflecting	20% ± 5%

In determining the level of complexity and cognitive demand of a task, consideration should be given to the extent to which the task requires the use of integrated content and skills drawn from different topics, the complexity of the context in which the problem is posed, the influence of non-mathematical considerations on the problem, and the extent to which the learner is required to make sense of the problem without guidance or assistance.

6. Exemplar SBA Tasks and Memos

INSTRUCTIONS AND INFORMATION (To apply in all the tasks in the booklet)

1. Carefully read the given scenario before answering the questions. **Answer ALL** the questions.
2. Number the answers correctly according to the numbering system used in the question paper.
3. You may use an approved calculator (non-programmable and non-graphical), unless stated otherwise.
4. Show ALL calculations clearly.
5. Round off ALL final answers appropriately according to the given context, unless stated otherwise.
6. Write neatly and legibly.

6.1 Grade 10 Tasks

6.1.1 (a) Assignment 1

Question 1

1.1 A bank charges 12% simple interest p.a. on cash loans to its clients. Tito has asked for a R10 000 loan amount and has promised to repay the loan over 4 years

1.1.1 Calculate the interest which Tito has to pay on the loan? (3)

1.1.2 Determine the total amount to be paid back. (2)

1.1.3 Determine the monthly repayment amount. (2)

1.2 Tilly wants to deposit money into her banking account at FNB bank:
R3,50 + R1,00 per R100 is charged for an over the counter deposit. When an own ATM is used for deposits, R1,00 per R100 (First 2 free per month) is charged and for ATM withdrawals at own bank R6,50 +R1,00 per R100 is charged
Determine the service fee which Tilly will incur, when:

1.2.1 R700 is deposited over the counter? (2)

1.2.2 R700 was deposited as follows: R100 on Monday, R200 on Tuesday, and R400 on Saturday during the first week of the month. (3)

1.2.3 R500 is withdrawn at an ATM? (2)

[14]

QUESTION 2

The table below indicates the bank charges which ABANK uses to provide services to it's customers.

Transaction type	
Monthly Fees	
Monthly account fee	R22 (Current Account) R30 (Silver, Gold, Platinum)
Deposits	
Cash deposit: Branch counter	R4,85 + 1,15% of deposit value
Cash deposit: ABANK ATM	R1,10 per R100 (or part thereof)
Cash Withdrawals	
Branch Counter	R27,00 + R1,15/R100 (max R500)
ABANK ATM	R3,85 + R1,10/R100
Account payments	
• ABANK ATM • Branch counter	R3,75 + R0,75/R100 R33,00
Debit and stop orders	
• Internal • External stop order • External debit order	R5,20 R3,75 + R0,75/R100 (max R15,00) R3,75 + R0,75/R100 (max R25,00)
Electronic Funds transfer	
• ABANK ATM • Branch counter	R3,15 R33,00
CASH SEND (ABANK ATM)	R6,90 + R1,05/R100

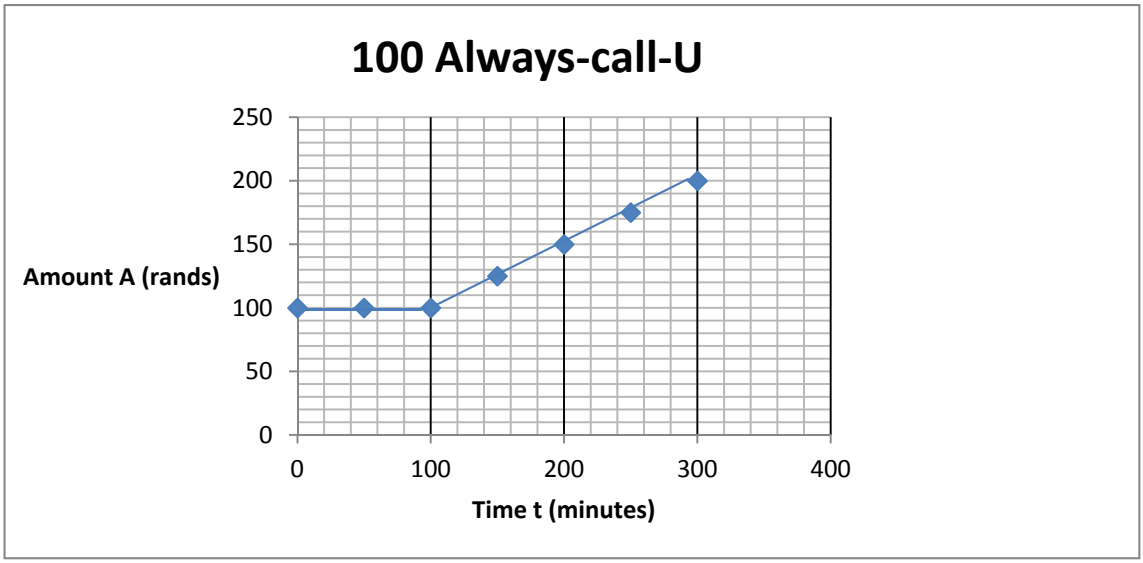
2.1 Calculate the bank charges if a client wants to send a cash amount of R300 to a friend at an ATM without using a card. (2)

2.2 Calculate the bank charges if she makes 3 electronic account payments as follows: paying her R400 rent, R400 electricity bill and a R400 phone bill. (3)

[5]

QUESTION 3

Cell 5 Network has increased their 2015 tariffs for the monthly subscription on the 100 Always-call-U charges of their contract phones. The fixed monthly contract rate will be R100 `with free 100 minutes and then thereafter a call charge will be 50 cents per minute.



3.1.1 Use the graph to complete the following table:

Time, t (minutes)	0	50	100	150	200	250	300
Call charges	0	0	0	25	50	D	E
Amount, A (rand)	A	100	B	125	150	C	200

(5)

3.1.2 Explain why the graph is plotted in a horizontal pattern from 0 to 100 minutes? (2)

3.1.3 Give a reason for the graph increasing in a straight line pattern after 100 minutes? (2)

3.1.4 The new rate on contract has been arrived at as a result of a 10% increase. Determine the 2014 monthly contract subscription? (2)

3.2 The relationship between John's Dad's petrol cost and people in the car when he travels to work in a car is shown below. He spends R50 when he travels alone. His father approached John for advice on saving on travel. John used the following table:

Number of people in car (n)	**1**	**2**	**3**	**4**	**5**
Dad's petrol cost in Rand (C)	**50**	**25**	**16.67**	**12.5**	**10**

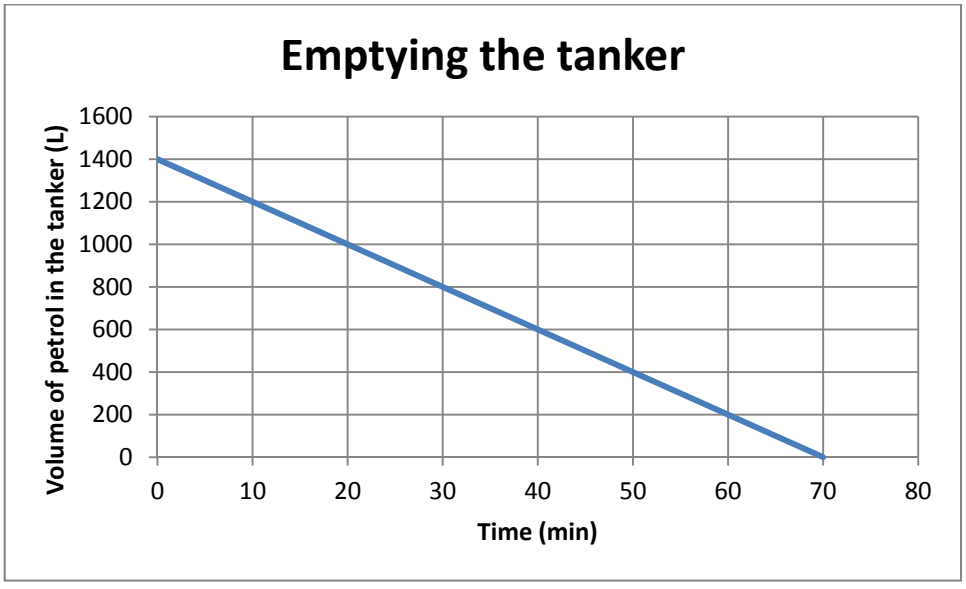
3.2.1 Describe the relationship in words. (2)

3.2.2 Draw a graph on a suitable set of axes on Annexure A. (3)

3.2.3 Is the graph representing a direct or indirect relationship (2)

3.2.4 The decision to include a 5th person is not advisable for his dad's condition. Give a reason. (2)

3.3 A petrol tanker arrived at John's home to refill the storage tank at their farm. A graph depicting how long it takes to empty the petrol tanker is shown:



3.3.1 Determine the maximum volume of petrol in the tanker? (2)

3.3.2 Determine the volume of the petrol that was left in the tanker after half an hour? (2)

3.3.3 Determine the time it will take the tanker to be half full. (2)

3.4 The tanker operator thought that within 1 hour he would have finished emptying the tanker and has scheduled an appointment with another client within I hour after the start of emptying the tanker. A penalty of R10 per minute for a late start will be levied

3.4.1 Justify whether the timing is appropriate or not. (3)

3.4.2 Calculate the penalty to be paid. (3)

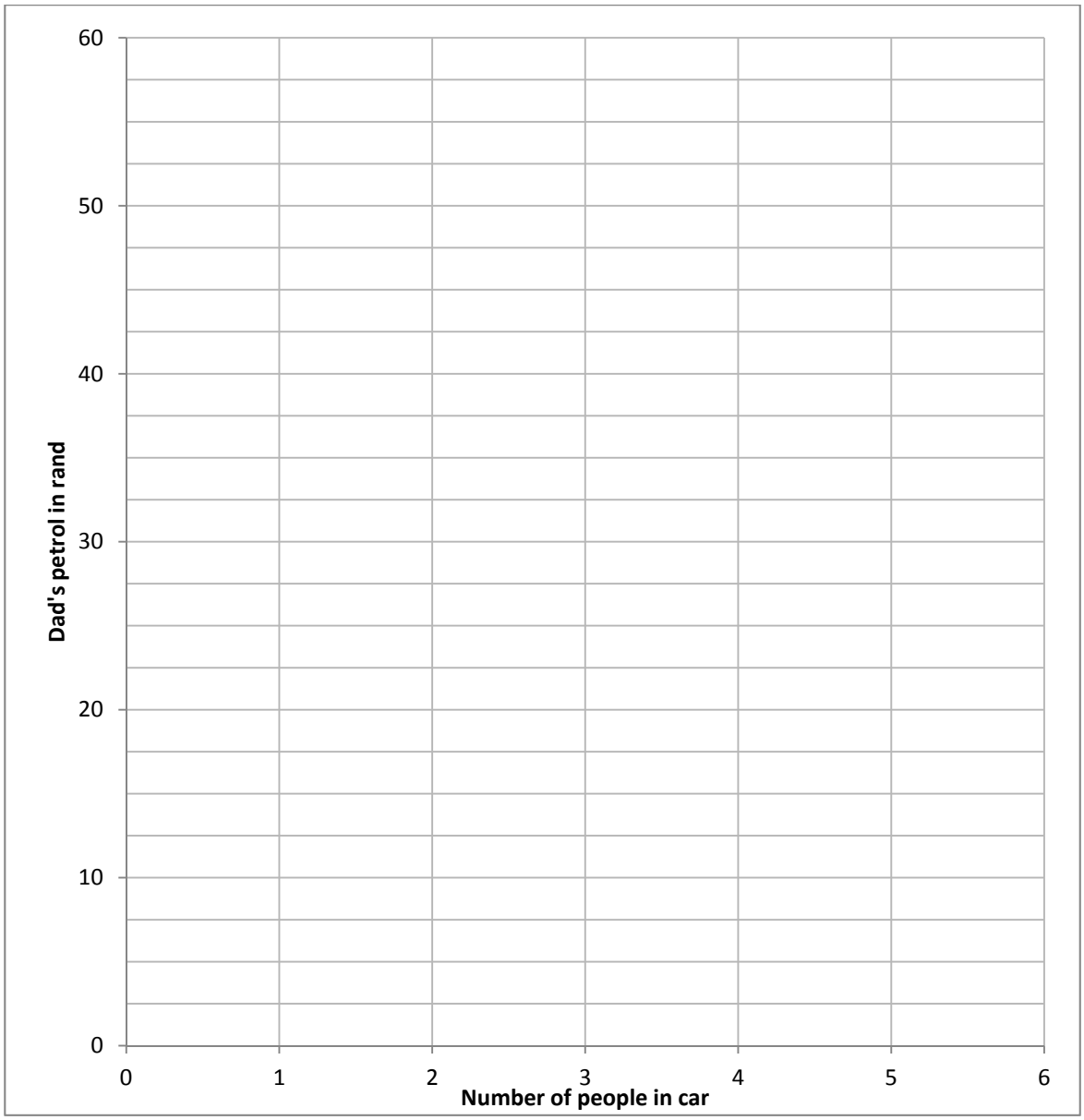
[32]

Name of learner: .....

Class: .....

ANNEXURE A

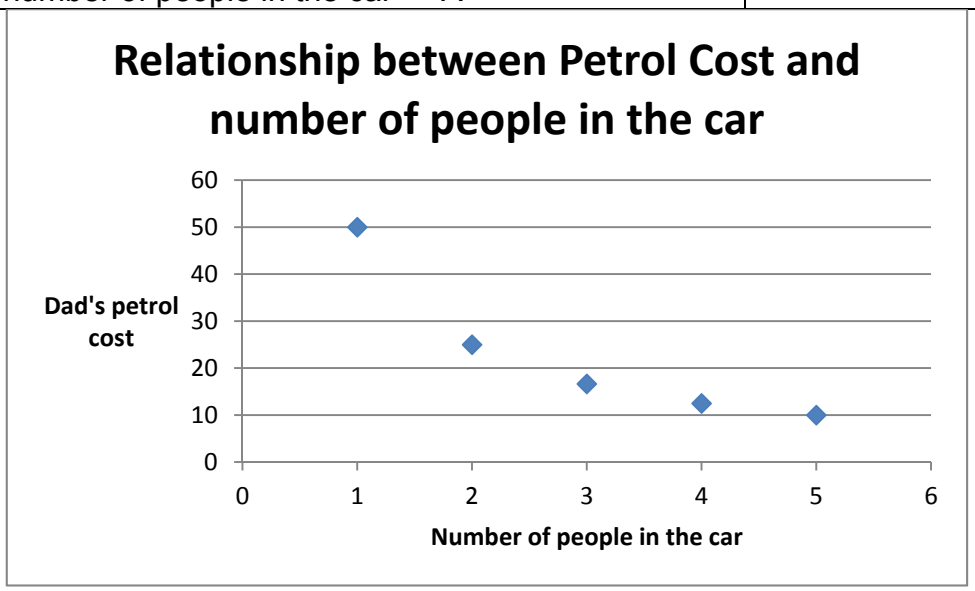
Question 3.2.2



6.1.1 (b) Assignment 1 Memo

TOTAL 50

Question	Calculation / Description	Explanation	Level
1.1.1	Interest to be paid in one year:= $\frac{12}{100} \times R10000$✓ M $= R1200\ p.a$✓ A For 4 years the interest = 4 X $R1200\ p.a.$✓ M = R4800✓ A	 1Multiplication 1Answer 1Multiplication 1Answer	3
1.1.2	Total amount to be repaid = R4800 + R10000 ✓ M = R14800✓ A	1Method 1Answer	2
1.1.3	Monthly repayment = $\frac{\text{R14800}}{48}$ ✓ M = R308,33✓ A	1Method 1Answer	2
1.2.1.	Cost of depositing over the counter: R3,50 + R1,00 X7✓ M = R10,50✓ A	1Method 1Answer	2
1.2.2	Monday and Tuesday deposits are free of service fee✓J But R400 will incur cost = R1,00 X 4✓M = R4,00✓ A	1Justification 1Method 1Answer	2
1.2.3	Withdrawal: R6,50 + 5XR1,00✓ M = R11,50✓ A	1 Method 1Answer	2
		[14]	
2.1	Cash send cost = R6,90 + 3 X R1.05✓ M = R10,05✓ A	1Method 1Answer	2
2.2	A R400 electronic payment charge is calculated using the following: R3,75 + R0,75/R100 R400 charges will be = R3,75 + R0,75/R100 X R400✓ M = R6,75 each Total charges = 3 X R6,75MA =R20,25✓ CA	1Method 1MA 1CAnswer	3
		[5]	
3.1.1	<table><tr><td>Time, t (minutes)</td><td>0</td><td>50</td><td>100</td><td>150</td><td>200</td><td>250</td><td>300</td></tr><tr><td>Call charges</td><td>0</td><td>0</td><td>0</td><td>25</td><td>50</td><td>75 ✓</td><td>100 ✓</td></tr><tr><td>Amount, A (in R)</td><td>100 ✓</td><td>100</td><td>100✓</td><td>125</td><td>150</td><td>175✓</td><td>200</td></tr></table> 1 for each answer (5)		1

3.1.2	You pay a fixed rate of R100 for calls less than 100 minutes ✓R	1Reason	**4**
3.1.3	For every minute after 100 minutes the cost increases by 50c per minute. ✓ R This is why the graph increases in a constant linear (straight line) pattern ✓R	2Reason	4
3.1.4	R100/1.1✓ M = R90.90✓ A	1M 1A	2
3.2.1	Dad's petrol cost is inversely dependant on the number of people in the car✓✓A	2A	1
3.2.2	 1: shape 1: labelled axes 1: title		2
3.2.3	Indirect/inverse✓✓A	1Answer	2
3.2.4	An overload results in an expensive fine or presents a driving risk✓✓R	2Reason	4
3.3.1	1400L✓RG	1Reading from graph	1
3.3.2	800L✓✓RG	2 Reading from graph	1
3.3.3	35 min✓✓RG	2 Reading from graph	1
3.4.1	After 1 hour there will still be 200L left in the tank✓✓J	2Justification	1
3.4.2	10min left so penalty will be R10/minX10min✓MA = R100✓C A	 1MA 1CA	2

6.1.2 (a) Assignment 2

QUESTION 1 ELECTRICITY TARIFFS

1.1 **A. ELECTRICITY REDISENTIAL SUPPLY – CONVENTIONAL**
MSUKALIGWA MUNICIPALITY TARIFF DESIGN MODEL BASED on ESKOM INCREASE

Residential Conventional up to 20AMP(EL 122)	NERSA Approved Tariff 2015/2016	Previous Year 2014/2015	NERSA Approved Tariff 2014/2015	Increased(avg cost and rate)
Fixed Charge per month			0,00000	13,67%
Energy Rate(c/kWh) (<= 50kWh) 50 units	0,00000	0,00000	0,74400	13,67%
		0,74400	0,93000	13,67%
Energy Rate(c/kWh) (51 - 350kWh) 300 units	0,80000	0,93000	1,23000	13,67%
		1,23000	1,41500	13,67%
Energy Rate(c/kWh) (351 – 600kWh) 250 units	1,02000	1,41500		
Energy Rate(c/kWh) (>600kWh)	1,39814			
	1,60843			

Residential Conventional above 20AMP(EL 102)	NERSA Approved Tariff 2015/2016	Previous Year 2014/2015	NERSA Approved Tariff 2014/2015	increased(avg cost and rate)
Fixed Charge per month	129.03000	115,00000	115,00000	13,67%
Energy Rate(c/kWh) (<= 50kWh) 50 units	0,80000	0,84116	0,74000	13,67%
		1,05713	0,93000	13,67%
Energy Rate(c/kWh) (51 - 350kWh) 300 units	1,02000	1,39814	1,23000	13,67%
		1,39100	1,39100	13,67%
Energy Rate(c/kWh) (351 – 600kWh) 250 units	1,39814			
Energy Rate(c/kWh) (>600kWh	1,58110			

RESIDENTIAL SUPPLY PRE-PAID

Residential PRE-PAID up to 20AMP(Indigent Subsidy)	NERSA Approved Tariff 2015/2016	Previous Year 2014/2015	NERSA Approved Tariff 2014/2015	increased(avg cost and rate)
Fixed Charge per month				
Energy Rate(c/kWh) (<= 50kWh) 50 units	0,80000	0,74400	0,84116	13,67%
		0,93000	1,05713	13,67%
Energy Rate(c/kWh) (51 - 350kWh) 300 units	1,02000	1,23000	1,39814	13,67%
	1,39814	1,41500	1,60843	13,67%
Energy Rate(c/kWh) (351 – 600kWh) 250 units	1,60840			
Energy Rate(c/kWh) (>600kWh)				

Residential PRE-PAID Above 20 AMP	NERSA Approved Tariff 2015/2016	Previous Year 2014/2015	NERSA Approved Tariff 2014/2015	increased(avg cost and rate)
Fixed Charge per month				
Energy Rate(c/kWh) (<= 50kWh) 50 units	129,03000	115,00000	115,00000	13,67%
	0,80000	0,74000	0,84116	13,67%
Energy Rate(c/kWh) (51 - 350kWh) 300 units		0,93000	1,05713	13,67%
	1,02000	1,23000	1,39814	13,67%
Energy Rate(c/kWh) (351 – 600kWh) 250 units	1,39814	1,39100	1,39100	13,67%
Energy Rate(c/kWh) (>600kWh)	1,58115			

Msukaligwa Municipality has two types of electricity tariffs; they are a flat rate as well as a pre-paid system rate.

1.1 Define the following terms:

1.1.1 Tariff (2)

1.1.2 Pre- paid tariff (2)

1.1.3 Flat – rate tariff (2)

1.2 Mrs Msibi uses a flat - rate system in her house. Study the table below that shows the various tariffs associated with the flat - rate system in Msukaligwa municipality

Service Scale A: Single Phase (40A)	**Energy Charge**
Basic charge per month (payable whether or not any electricity is used)	R 209,44
Energy charge per kWh	41,953C

1.2.1 Calculate the basic charge per month on this system? (2)

1.2.2 What does the basic charge per month mean/ imply? (2)

1.2.3 Determine the charge tariff per unit of electricity used. (2)

1.3 The following method can be used to determine the cost of electricity on this system:

Cost = basic charge + (R 0, 41953 × number of units of electricity)

1.3.1 Use this method to show that the cost of using 100 units on this flat-rate system is R 251, 39. Is the basic charge advantageous, motivate? (3)

1.3.2 Mrs Msibi uses an average of 140 units of electricity per month. Calculate her monthly electricity cost. (2)

1.4 Complete the following table by calculating how much it will cost to use the various units of electricity shown in the table on a 40A Flat-rate system in Msukaligwa Municipality

Units of electricity	0	100	200	(c)	500	800
Monthly cost on a 40A Flat – rate system	(a)	R251,39	(b)	R335,30	(d)	(e)

(5)

1.5 Use the table of values above to draw the graph to represent the information in the table. (5)

1.6 Use the graph to answer the following questions:

1.6.1 Approximately how much will it cost Mrs Msibi if she uses 600 units of electricity in a month on this system (2)

1.6.2 If Mrs Msibi receives an electricity bill of R400.00, approximately how many units of electricity did she use during the month? (2)

1.7 Why does the graph not start at 0 on the vertical axis and at what value does the graph start on the vertical axis? (2)

1.8 Explain where **R209,44** comes from in terms of the different tariffs associated with this electricity system. (2)

1.9 Why is the graph a straight line? (2)

1.10 The table below shows the comparison of the tariffs for a 40A Flat-rate system in Carolina and Ermelo towns:

40A Flat –rate system	Basic Charge	Energy Charge (c/ kWh)
CAROLINE	----------	50,16
ERMELO	R 209,44	41,953

Mrs Msibi has a sister who lives in Carolina and who is also on a 40A Flat-rate system. If Mrs Msibi and her sister were to both use 140 of electricity in a month, who will pay more for electricity? Explain your answer and show all calculations. (5)

[42]

QUESTION 2 **MUFFIN MADNESS**

The grade 10 class is going to bake muffins. The recipe that they are going to use requires the following ingredients:

RECIPE

- ✓ *2 Eggs*
- ✓ *125ml Cooking oil*
- ✓ *375ml brown sugar (300g)*
- ✓ *500ml Milk*
- ✓ *300g Whole wheat flour*
- ✓ *375ml cake flour (210g)*
- ✓ *5ml Salt*
- ✓ *5ml Vanilla Essence*
- ✓ *10ml Bicarbonate of soda*
- ✓ *250ml Raisins (150g)*

2.1 The volume of 150g of Whole wheat is 250ml. Calculate the volume of the Whole wheat flour in the recipe (3)

2.2 When they are all mixed together, all the above ingredients make up 2 litres of mixture (because some parts dissolve into other parts).

2.2.1 Convert 2 litres into ml (2)

2.2.2 How many muffins can the above recipe make if 60ml is required for each muffin? (3)

2.2.3 Using your answer to question 2.2.2, how many eggs will the girls need to buy to make 500 muffins? (3)

2.3 The students need to make 500 muffins, using muffin trays that hold 6 muffins per tray. They plan to put 4 trays at a time into the ovens. Each oven takes 30 minutes to bake. How long will they take to make 500 muffins if they will be using 4 ovens? (4)

2.4 The recipe gives the baking temperature as 356^0F. However, the ovens in the Consumer Studies lab are in ^{0}C. Use the following formula to convert this temperature to ^{0} C.

$^0C = 5/9(\ ^0F - 32^0)$ (3)

2.5 The students are aiming to make at least R1500 in profit on the sale of their muffins

2.5.1 Calculate the profit that the students will make per muffin. (2)

2.5.2 Calculate the percentage profit (% increase) on each muffin if the cost price of each muffin is R2,50 (3)

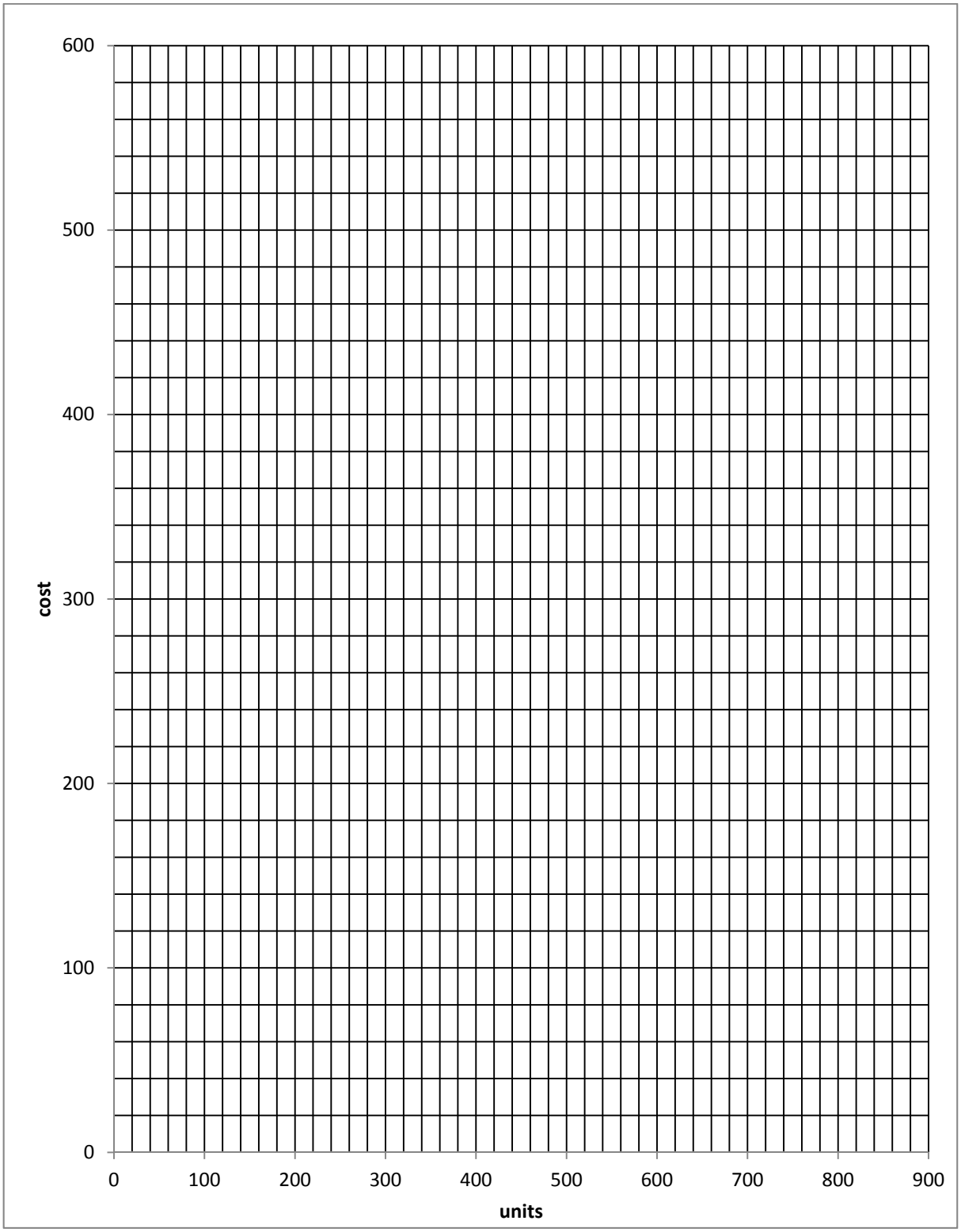
2.6 The students are planning to split the profit of R1500 between two charities in the ratio 1:2. How much money will each charity get if they reach their planned profit? (3)

[26]

TOTAL = [68]

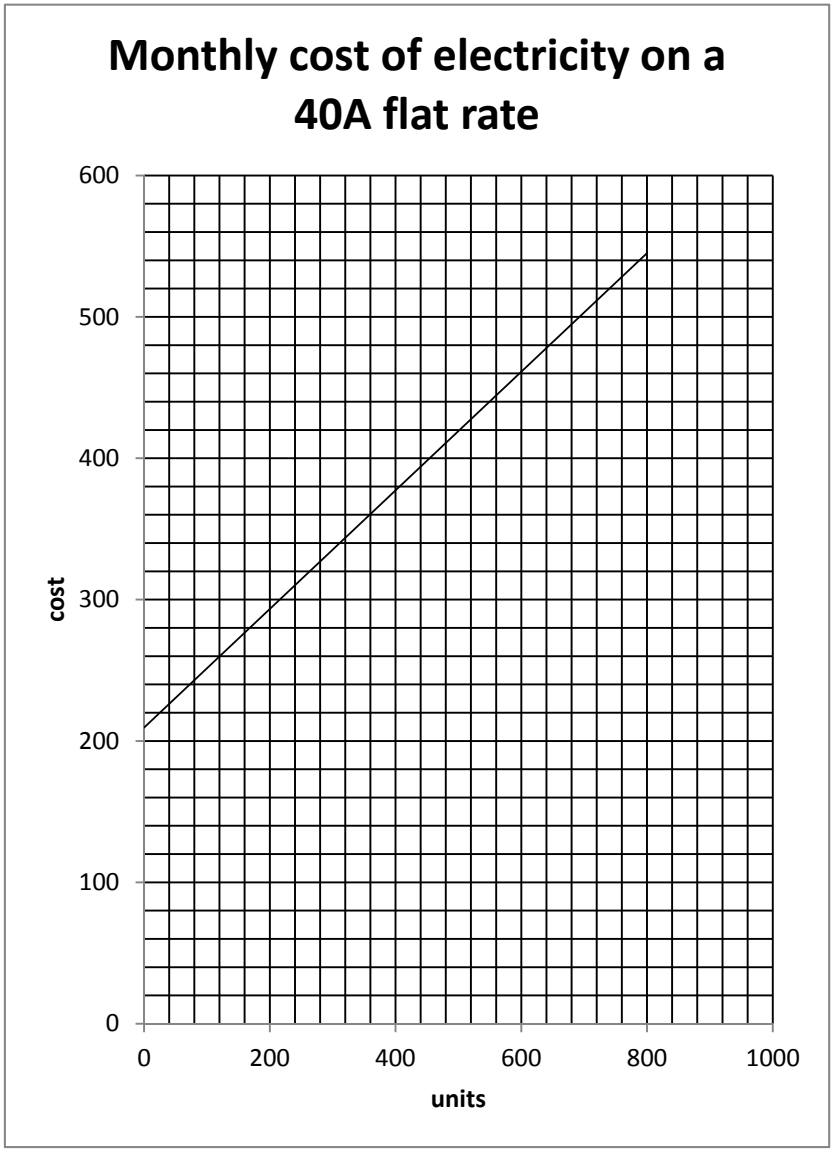
ANNEXURE A 1.5

NAME:_____GRADE: 10



6.1.2 (b) Assignment 2 Memo

<table>
<tr><th>QUESTION</th><th>SOLUTION</th><th>Mark</th><th>Level</th></tr>
<tr><td>1.1.1</td><td>A fee that is charged for using a particular service. ✓✓</td><td>2 Ex</td><td>TL1</td></tr>
<tr><td>1.1.2</td><td>The cost at which a service is provided for which payment is made in advance. ✓✓</td><td>2 Ex</td><td>TL1</td></tr>
<tr><td>1.1.3</td><td>This is where a customer pays the same amount whether they use the electricity in bursts during mid-day, when demand and the utility's costs are highest, or did not use electricity✓✓</td><td>2 Ex</td><td>TL1</td></tr>
<tr><td>1.2.1</td><td>Basic charge = R209,44✓✓</td><td>2RT</td><td>TL1</td></tr>
<tr><td>1.2.2</td><td>The basic charge is a fixed monthly charge that is not dependent on the units of electricity used during the month. ✓✓</td><td>2 Ex</td><td>TL1</td></tr>
<tr><td>1.2.3</td><td>Electricity charge = 41,953c or R0,41953✓✓</td><td>2 MA</td><td>TL1</td></tr>
<tr><td>1.3.1</td><td>Cost = basic charge + (R0,41953 X no of units of electricity)
= R209,44 + (R0,41953 X 100) ✓
= R209,44 + R41,95✓
= R251,39✓</td><td>1Su
1Si
1A
3</td><td>TL4</td></tr>
<tr><td>1.3.2</td><td>Cost = basic charge + (R0,41953 X no of units of electricity)
= R209,44 + (R0,41953 X 140) ✓
= R209,44 + R58,73
= R268,17✓</td><td>1S
1 A
2</td><td>TL2</td></tr>
<tr><td>1.4</td><td><table><tr><td>Units of Electricity</td><td>0</td><td>100</td><td>200</td><td>300✓</td><td>500</td><td>800</td></tr><tr><td>Monthly cost on40A Flat-rate system(R)</td><td>209,44 ✓</td><td>251,39</td><td>293,35 ✓</td><td>335,30</td><td>419,21 ✓</td><td>545,06✓</td></tr></table>
5</td><td></td><td>TL2</td></tr>
</table>

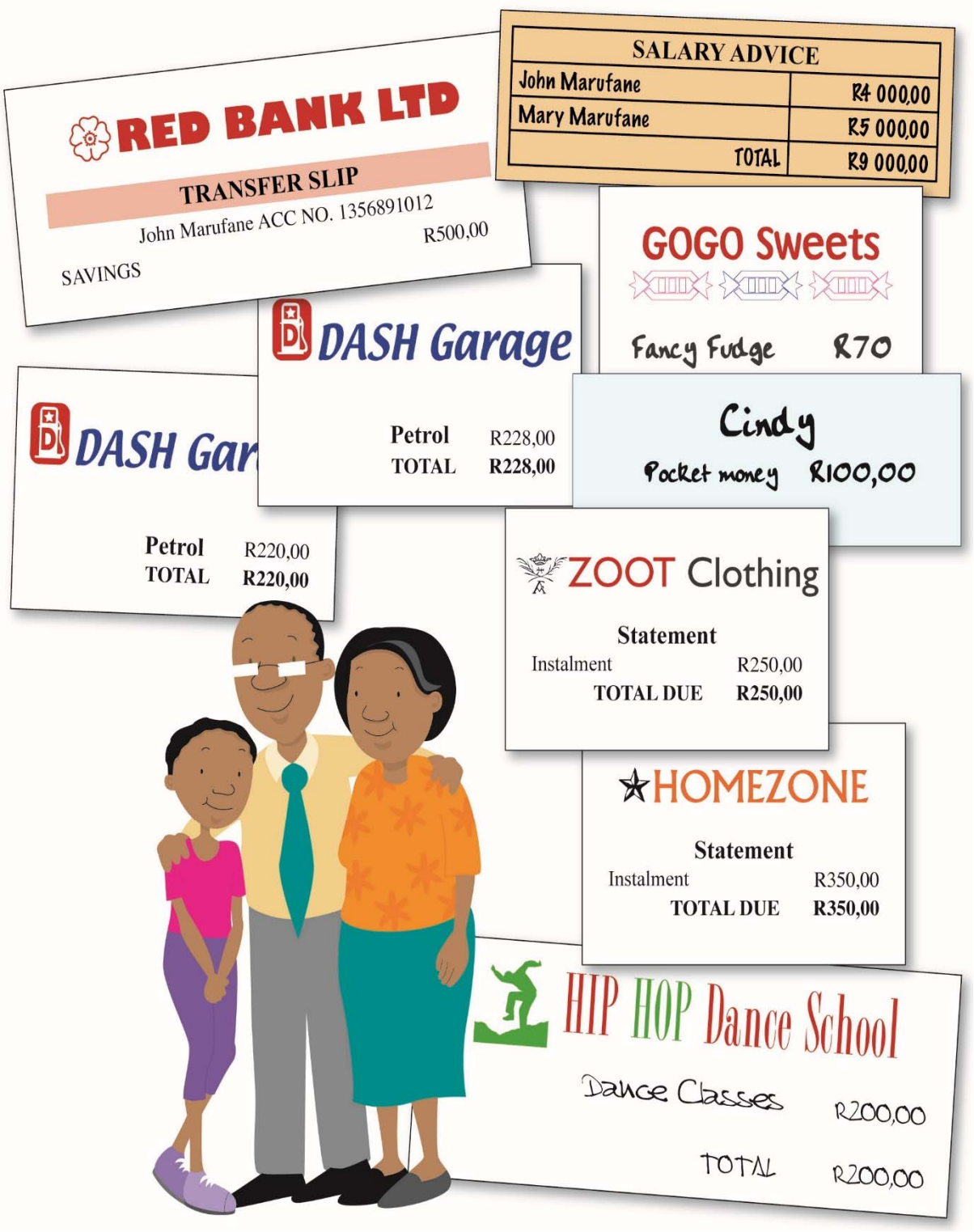
1.5	 ✓ 2 accurate plotting of remaining points✓✓ 1 Accurate shape✓ 1 Point on vertical axis✓	(5)	TL2
1.6.1	Approximately R460 (accurate answer R461,16) ✓✓ Give full marks if the answer is in the range R458 to R462	2 RG	TL1
1.6.2	Approximately 450 units (accurate answer 454,22) ✓✓ Give full marks if the answer is in the range 448 to 455 units	2 RG	TL 1
1.7	There is a basic charge that you pay every month even if you don't use any electricity. This fee totals to R209, 44. ✓✓	1Ex 1RG	TL 4
1.8	As such, the graph starts at R209,44 on the vertical axis✓✓	2Ex	TL 1

1.9	For every one unit of electricity used the amount payable increases by a constant value of R0, 41953. As such, there is a constant increase, which gives rise to a straight line✓✓	2 Op	TL 4
1.10.1	From 1.3.2, Mrs Msibi's cost for 140 units = R268,17. ✓ Mrs Msibi's sister's cost = R0,9016 X 140✓ = R126,22✓ Therefore Mrs Msibi pays more✓✓	2M 2A 1 Op 5	TL 4
2.1	g : ml 150 : 250 300 : ?more✓ 300 ÷ 150 X 250✓ =500ml✓	1M 1MA 1A 3	TL 2
2.2.1	2 litre = 2 x 1000 = 2000ml✓✓	2C	TL 1
2.2.2	2000 ml ÷ 60ml✓ = 33.33 muffins✓ = 33 muffins✓	1M 1MA 1A 3	TL 2
2.2.3	2 eggs : 33 muffins ? : 500 muffins✓ 500÷ 33 x 2✓ = 30 eggs✓	1M 1MA 1A 3	TL 3
2.3	6x4 = 24 per oven✓ 24x4 = 96 muffins at a time✓ No of batches = 500÷96 = 5,21 = 6 batches✓ Therefor total time = 6 x 0.5hours = 3 hours or 180 minutes✓	2M 1A 1Rou 4	TL 3
2.4	^{0}C = 5/9(^{0}F- 32^0) ^{0}C = 5/9(356^0- 32^0) ✓ = 5/9 X 324✓ = 180^{0}C✓	1S 1M 1A 3	TL 2
2.5.1	Profit per muffin =R1500÷ 500✓ = R3,00 per muffin✓	1M 1A 2	TL 2
2.5.2	Profit = R3,00 = %profit profit/cost X 100✓ = 3,00/2,50 X 100✓ = 120%✓	1M 1S 1A 3	TL 3
2.6	Total parts = 1+2 = 3 Charity 1 = ⅓ x R1500✓ = R500✓ Charity 2 = ⅔ x R1500 = R1000✓	1M 1S 1A 3	TL3
	TOTAL	**68**	

6.1.3 (a) Assignment 3

Question1:**Finance**

Look at the salary advice slips, receipts, bank statement and cheque stubs collected by the Marufane family, then answer the questions that follow.


RED BANK LTD
TRANSFER SLIP
John Marufane ACC NO. 1356891012
R500,00
SAVINGS
SALARY ADVICE
John Marufane R4 000,00
Mary Marufane R5 000,00
TOTAL R9 000,00
GOGO Sweets
Fancy Fudge R70
DASH Garage
Petrol R228,00
TOTAL R228,00
DASH Gar
Petrol R220,00
TOTAL R220,00
Cindy
Pocket money R100,00
ZOOT Clothing
Statement
Instalment R250,00
TOTAL DUE R250,00
HOMEZONE
Statement
Instalment R350,00
TOTAL DUE R350,00
HIP HOP Dance School
Dance Classes R200,00
TOTAL R200,00

1.1 Create a table and use it to put the Marufane household expenses into categories, clearly indicating items and its cost in each category. (10)

1.2 Use the information from the slips and the categories you have developed to draw up a household budget for the Marufane family. You will need to decide which expenses are fixed and which are variable. Use the following headings. '' Fixed expenses '' ,'' Total fixed expenses'' , ''Variable expenses '','' Total variable expenses '' ,'' Total expenses '', ''Total income'' , '' Balance '' (10)

1.3 Analyse a budget for the Marufane household and make recommendations as to how the expenditure should be changed to improve the finances of the Marufane household (5)

[25]

Question 2: **Measurement**

Jane and Tom are considering redesigning their front garden. They plan to plant several trees in the garden and to cover the remainder of the garden with grass. The illustration below provides a view from above of their front garden. Each hole shown below, has a radius.

2.1 Explain the meaning of the term "radius". (3)

2.2 Determine the radius of ONE of the holes that has been dug out for the trees if the area of the hole is 0.79 m^2?

Use the following equation: r = $\sqrt{\frac{A}{\pi}}$ (4)

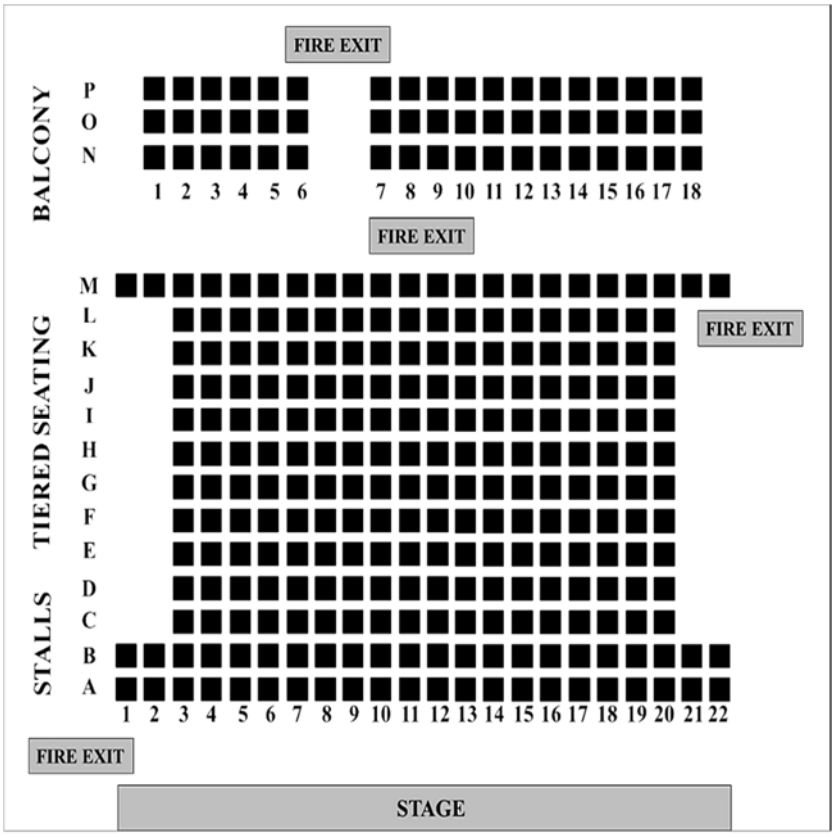
2.3 If the perimeter of the garden is 24 *m* and the width of it is 4 *m* how much will be the length of it? **Hint Perimeter is = 2 (*l* +*b*)** (4)

2.4 What will be the diameter of ONE of the holes with a radius of 0, 5 *m*? (2)

[13]

Question 3: Maps, plans and other representation of physical world.

Study the sitting plan of a school hall below and answer the questions that follow.



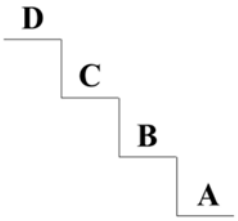
3.1 How many rows are behind seat G7? (2)

3.2 Is seat A1 a good seat to view a movie? Give a reason for your answer (2)

3.3 Do you think there are enough emergency exits in the school hall? (2)

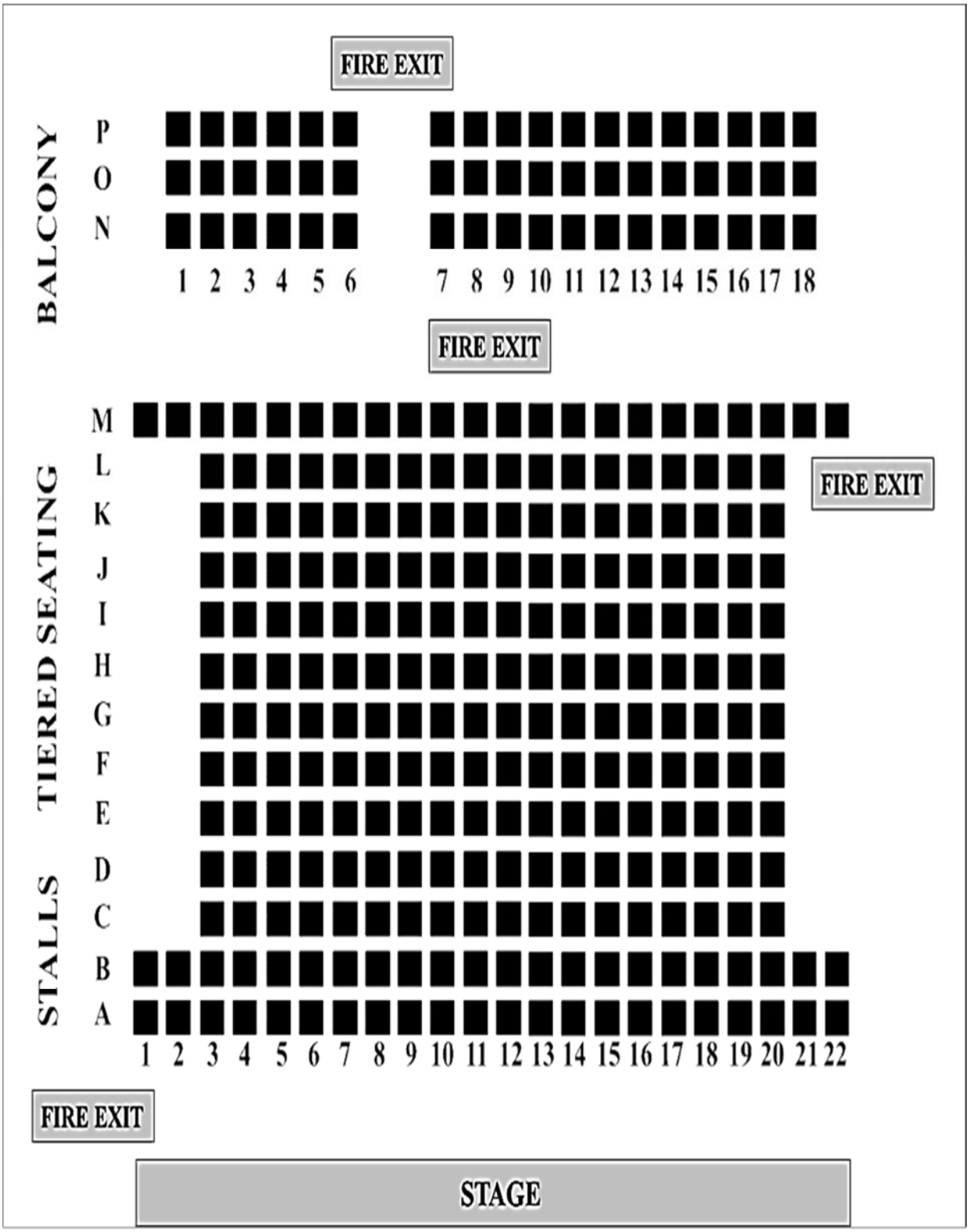
3.4 Use the Annexure A to indicate the evacuation route in case there is a fire in the school hall (4)

3.5 The school hall is stepped and each step is 22 cm high. How high is a seat in row K from a seat in row C?



(2)
[12]

ANNEXURE A Name of the Learner:_____



QUESTION 1[25]

<table>
<tr><th>Question</th><th>Solution</th><th>Explanation</th><th>Level</th></tr>
<tr><td>1.1</td><td>
<table>
<tr><td>Home expenses</td><td>School expenses</td><td>Transport expenses</td></tr>
<tr><td>Rent - R3500
Electricity - R300
Grocery - R976
Furniture - R350✓✓</td><td>School fees - R450✓✓</td><td>Petrol-R231 + R220 + R228
Insurance - R500✓✓</td></tr>
<tr><td>Telephone expenses</td><td colspan="2">Extra expenses</td></tr>
<tr><td>Telephone - R192
Telephone - R192
cellphone voucher - R275✓✓</td><td colspan="2">Flowers - R150
Entertainment - R400
Pocket money - R100
Sweets - R70
Takeaways - R120
Dancing lessons - R200
Clothing - R250
Savings - R500✓✓</td></tr>
</table>
</td><td>2 marks for home expenses
2 marks for school expenses
2 marks for transport expenses
2 marks for telephone expenses
2 marks for extra expenses (10)</td><td>1</td></tr>
<tr><td>1.2</td><td>
<table>
<tr><td colspan="2">FIXED EXPENSES</td></tr>
<tr><td>Rent</td><td>R3500</td></tr>
</table>
</td><td>2 marks for fixed expenses</td><td>2</td></tr>
</table>

	Transport(petrol) Insurance Savings School fees Dancing classes Pocket money	R679✓✓ R500 R500 R450 R200 R100	2 marks for variable expenses. 1 mark for total variable. 1 mark for total expenses. 1 mark for R 4 500 salary. 1 mark for R 5 000 salary. 1 mark for total income. 1 mark for left to spend OR save. (10)	
	TOTAL FIXED EXPENSES	R5929		
	VARIABLE EXPENSES Telephone/cellphone Clothing account Furniture account Groceries Electricity Flowers Coffees, takeaways entertainment etc.	 R467 R250 R350 R976✓✓ R300 R150 R590		
	TOTAL VARIABLES EXPENSES	R3083✓		
	TOTAL EXPENSES	R9012✓		
	INCOME Salaries salaries	 R4500✓ R5000✓		
	TOTAL INCOME	R9000✓		
	LEFT TO SPEND OR SAVE SHORTFALL	-R12 ✓		

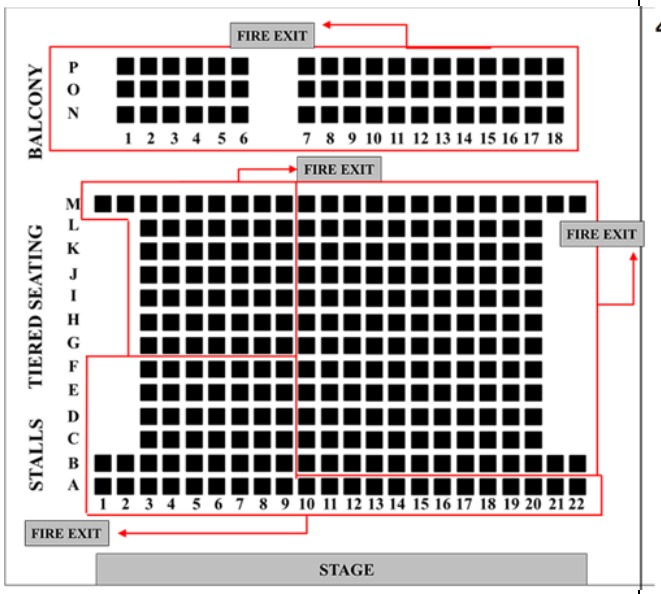
1.3	The Marufane family is in debt✓, i.e. they spend more than they earn. ✓✓ Learners can make suggestions such as cutting down on spending, being more careful about the electricity used, paying off the accounts and closing them, using less money on 'wants' like entertainment and take-away, using a telephone instead of a cellphone etc.✓✓	1 mark for opinion 2 marks for justification 2 marks for suggestions / opinion (5)	4

QUESTION 2 [13]

Ques #	Solution	Explanation	Level
2.1	A straight line from the Centre to the circumference of a circle or sphere.✓✓ Unit is m/cm/mm etc.✓ **(any applicable unit)**	2 marks for definition of the term 1 mark for unit	1
2.2.	$r = \sqrt{\frac{A}{\pi}}$ $= \sqrt{\frac{0.79}{3.142}}$ ✓✓ $= 0.50$ ✓$_m$✓	2 marks for substitution 1 mark for answer 1 mark for the unit	3
2.3	P = 2 (l +b) 24 ÷2 = 12✓✓ 12 – 4✓ = 8 Therefore the length is 8 m✓	2 marks for substitution in the formula 1 mark for subtraction 1 mark for the answer	3

2.4	$d = 2r$ $= 2 \times 0,5$ ✓ $= 1\ m$ ✓	1 mark for multiplying radius by 2 1 mark for the answer	2

QUESTION 3 [12]

Ques #	Solution	Explanation	Level
3.1	6 rows✓✓	2 marks for answer	2
3.2	No, it is not a good seat,✓ the person will have to look sideways at the stage.✓	1 mark opinion 1 mark for justification	4
3.3	Yes✓, there are 4 emergency exits✓	1 mark for answer 1 mark for justifying	2
3.4		4A: Theatre logically divided into 4 blocks, each block assigned to a fire escape.	4
3.5	$=8\times22$✓ $=176\text{cm}$✓	1 mark for 8 rows x 22 cm 1mark for answer	3

6.1.4 (a) Investigation 1

CHILD GRANT BUDGET

Sixteen - year old Madelei has a 3-month old baby. She is eligible for the monthly child grant from the state, because she is unemployed.
In this task you need to find out more about the child grant and draw up a budget for Madelei based on the money available to her. Assume that Madelei has only one child.

1. If you have access to the Internet, go tohttp://www.sassa.gov.za/ INTRODUCTION - TO SOCIAL -ASSISTANT-642aspx. Alternatively, you may phone toll free
0800 60 10 1

   1.1 How did you get information about the child grant?

   1.2 Define child grant.

   1.3 How much is the child grant?

   1.4 Who is eligible to receive it?

   1.5 How does the money get paid? (10)

2. Interview Madelei to find out what she needs to buy every month for the baby. Develop a questionnaire that you are going to use and hand it in with your investigation and draw up a list of items based on the information from the interview. (10)

3. Visit any shop to get comparative prices of the items and present your information in a suitable table **OR** provide evidence from the shop. (10)

4. Draw up a monthly budget for Madelei. Your budget must be reasonable in terms of Madelei's income from the grant. You might have to leave off certain items after careful consideration. (10)

5. Provide **five** financial advices to Madelei explaining why it is necessary to leave out certain items and guide her on alternative ways to obtain those items or how to cope without those items. (10)

TOTAL: 50

6.1.4 (b) Investigation 1 memo

GRADE 10 – MATHEMATICAL LITERACY – INVESTIGATION – RUBRIC

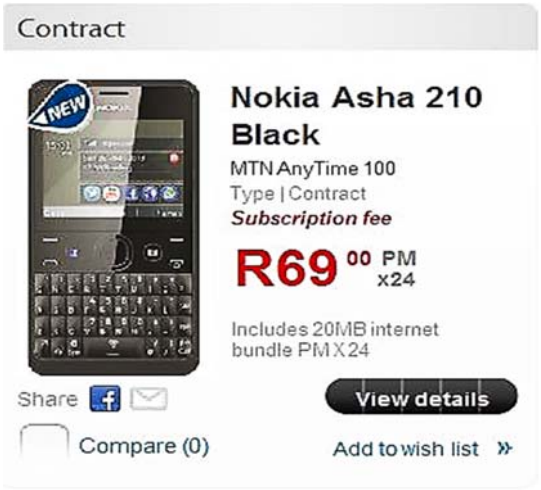
Name_____ **Grade_____**

	MARKS (10)	MARKS (8)	MARKS (6)	MARKS (4)	MARKS. (2)	MARK (0)	obtained
1	Obtained all relevant and realistic information by answering all questions	Obtained relevant information and answered four questions	Obtained relevant information and answered three questions	Obtained relevant information and answered two questions	Obtained relevant information and answered one question.	No effort	
2	Relevant questionnaire and the list of items that need to be bought	Questionnaire is appropriate and covers most items to be bought	Questionnaire is appropriate but covers few items	Questionnaire is appropriate but covers too little items to be bought	Questionnaire is incomplete/ inappropriate and the list is irrelevant	No effort	
3	All comparative prices from the shop are provided in a suitable table with complete evidence.	Some comparative prices from the shop are provided in a suitable table with complete evidence.	Few comparative prices from the shop are provided in a suitable table with complete evidence.	Few comparative prices from the shop are provided in an unsuitable table with complete evidence.	Few comparative prices from the shop are provided, but no table provided.	No effort	
4	Monthly budget drawn up correctly and reflects income and expenditure with the expenditure being not more than the income	Monthly budget drawn up correctly and reflects only the income and expenditure.	Monthly budget drawn up with some parts of income and expenditure correct.	Monthly budget drawn up with too little parts of income and expenditure correct.	Monthly budget drawn up with too little parts of income and expenditure not shown correctly.	No effort	
5	Five sound context appropriate advices and recommendations provided to Madelei	Four sound context appropriate advices and recommendations provided to Madelei	Three sound context appropriate advices and recommendations provided to Madelei	Two sound context appropriate advices and recommendations provided to Madelei	One sound context appropriate advice and recommendations provided to Madelei	No effort	
						TOTAL	

6.1.5 (a) Investigation 2

Question 1

John sees an advert in the newspaper about a Nokia Asha 210 cell phone. Study the advert below and answer the questions that follow.



1.1. Determine the number of months that you will pay the subscription fee? (2)

1.2. Determine the number of free bundles that the phone gives? (2)

1.3. Explain the term subscription fee in this context. (2)

1.4. Determine the time of the day that you can use the free minutes in the contract (2)

1.5. Calculate the total cost to be paid after 24 months, if John is using less than 100 minutes and 20 MB per month. (2)

1.6. If John skips one instalment for the phone, will he still pay the same amount of money as above? Explain your answer. (3)

1.7. Asha 210 contract charges R1.50/min. Determine the values of A, B and C in the Table 1 below. (6)

Table 1: Talk time vs. monthly costs

Talk Time in minutes	**0**	**50**	**100**	**150**	**200**	**250**	**300**	**B**	**400**	**450**	**500**
Asha 210 in rand	0	0	A	75	R150	R225	R300	375	R450	C	R600

1.8. Draw the graph using the information from the table above on Annexure A. (8)

1.9. If John used the Asha 210 for 600 minutes in a month and was billed R819, verify whether his billing was correctly done. (6)

1.10. If John loves social networks and visits other sites while surfing the internet for information, will this contract phone be cost effective? Give a reason. (3)

1.11. When buying a contract cell phone what other factors besides prices do people consider when making a decision? Name two. (4)

[40]

Question 2

The selling price of a new Nokia Asha 210 is R1199 on prepaid

Charges for prepaid calls
MTN TO MTN
R1.20 for 3 minutes billed per second and 57 minutes free

MTN TO OTHER
79c per minute billed per second

SMS
R0,50 per SMS

2.1. What does SMS stand for? (2)

2.2. Calculate the amount that Mpho will pay to write 10 SMS's to friends. (2)

2.3. Determine the balance on Mpho's cell phone if she buys airtime for R30 and makes an MTN call for 43 minutes. (3)

2.4. Calculate the amount that Mpho will pay if she was given a 10% discount on the phone. (3)

[10]

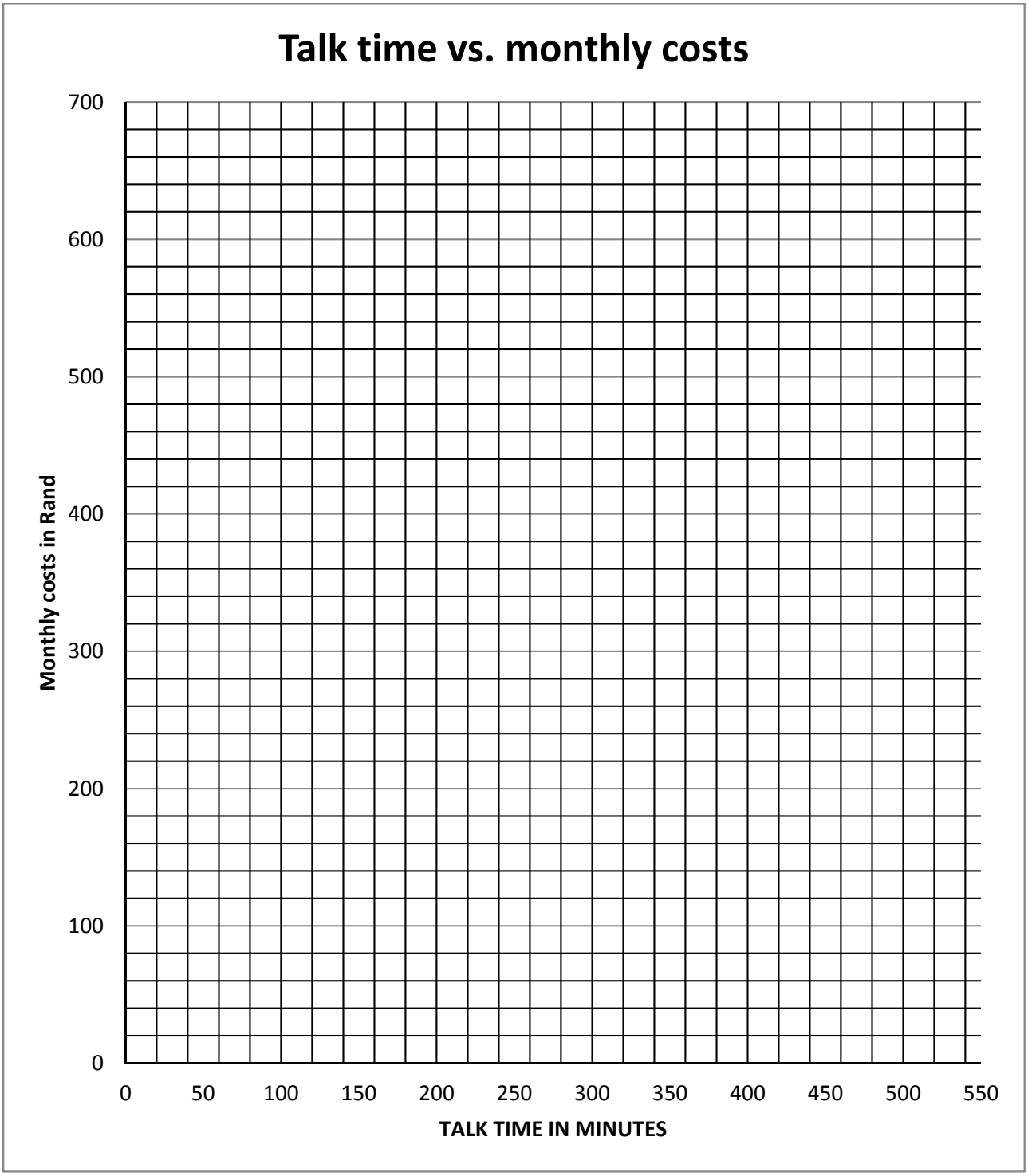
GRAND TOTAL: 50

Name of learner: _____

Class : _____

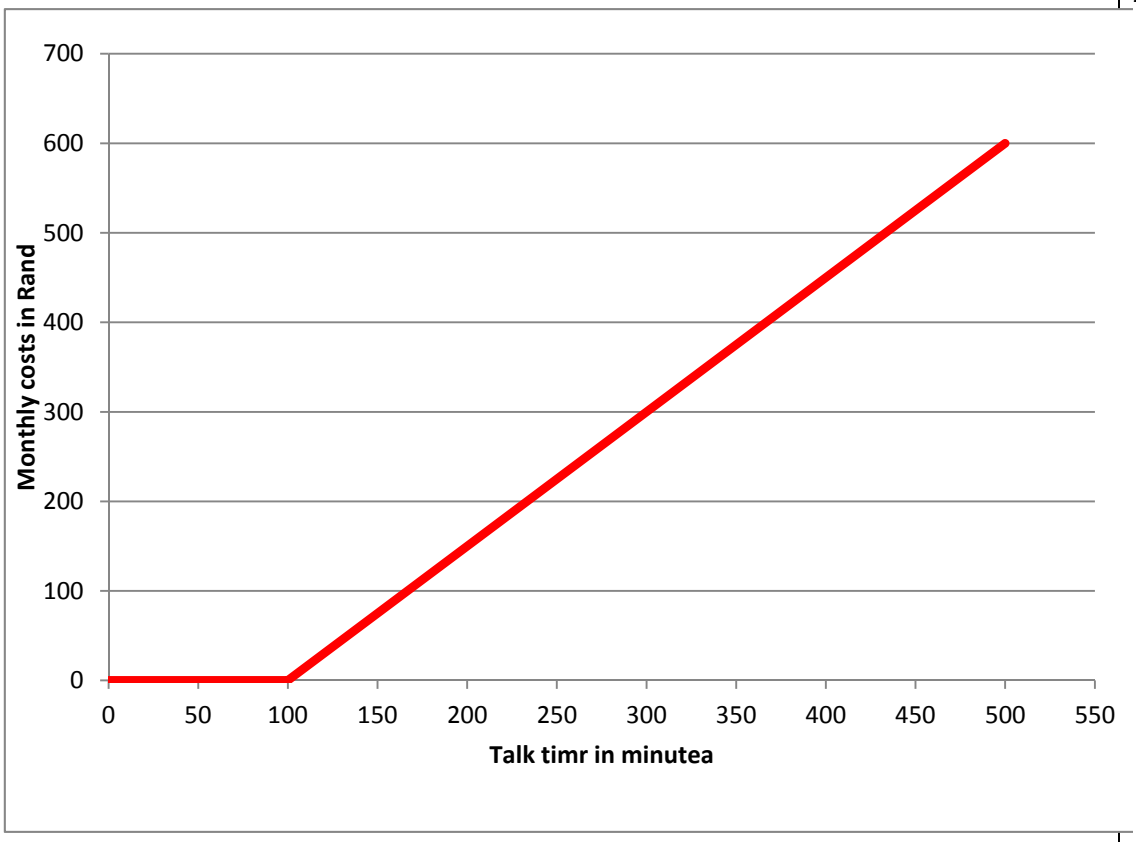
ANNEXURE A

Question 1.8.



6.1.5 (b) Investigation 2 memo

Question	Solution	Explanation	Levels
1.1	24 months✓✓A	2A: Answer	1
1.2	20MB per month✓✓A	2A: Answer	1
1.3	Subscription fee is an initiation fee paid as part of the contract. ✓✓A	2A: Answer	1
1.4	Anytime ✓✓ A	2A: Answer	1
1.5	Cost = R69 x 24 months✓M = R1 656✓CA	1M: Method 1CA: Answer	1
1.6.	No✓A, he will be penalised and pay more✓✓R	1A: Answer 2R: Reason	4
1.7	A = 0✓✓A B = 350 minutes✓✓A C = R525✓✓A	6: Answers	2

1.8	 6: Any three points plotted 2: Shape		2
1.9.	If John used the Asha 210 for 600 minutes in a month his total monthly cost would be R819 Number of minutes = 600 Total talk time charged = (600 – 100) min✓M = 500 minutes✓A Charge = R1.50 per min x 500 min✓M = R750✓CA Total cost = subscription fee + charge for calls✓M = R69 + R 750 = R819✓CA	1M: Subtraction 1A: Answer 1M: Multiplication 1CA: Answer 1M: Addition 1CA: Answer	3
1.10	No✓A, because 20MB may be little and shell have to buy more data✓✓R	1A: Answer 2R: Reason	4

1.11	Availability of stock✓✓A Colour✓✓A Features ✓✓A Portability✓✓A	4A: Answer (Any two)	2
2.1	SMS stand for Short Message Services✓✓A	2A: Answer	1
2.2	payment = 10 SMSes x R0,50 ✓M = R5✓CA	1M: Multiplication 1CA: Answer	1
2.3	charge for 43 minutes = R1.20 for 3 min + 40 min free✓M Balance = R30 – R1.20✓M = R28.80✓CA	1M: Addition 1M: Subtraction 1CA: Answer	2
2.4	cost = R1199 x 90%✓✓MA = R1 079.10✓ CA	2MA: Multiplication 1CA: Answer	2

6.1.6 (a) Investigation 3

PART ONE: Drawing a floor plan of your house

Investigate various floor plans and different fixtures used on floor plans and do the following

1.1 Measure the longest walls of your house

1.2 Develop a scale such that you can draw your house on an A4 page

1.3 Measure the length of all other outside and inside walls; convert these measurements using your scale and draw these to complete your house floor plan

1.4 Label these rooms and indicate the width of the door openings on the plan, make use of necessary keys

1.5 Measure the length and widths of all built-in fixtures (such as counters), and add them in your plan

1.6 Use Part 2 below to draw the layout of the tiles on the plan (keeping 2 cm between tile, and 1 cm between a tile and its edge)

PART TWO: Collection of Data

2.1 Go to the tile selling store and identify the type of tile you will use

2.2 Determine dimensions of the tile to be used

2.3 Determine how it is packaged (how many per package), provide evidence or diagram

2.4 Determine the cost of a package of tiles you will us

2.5 Determine the cost of a grout bag, and how many will be needed for your required area

2.6 Determine the labour cost for tiling (R/square meter)

PART THREE: Calculating Cost

3.1 Calculate the number of packages of tiles needed (create a 10% allowance for breakages)

3.2 Use Part 1 and 2 to determine the cost of grout required

3.3 Use Part 1 and 2 to determine the labour cost for tiling the house

3.4 Determine the total cost of tiling the required area

TOTAL: 50 MARKS

6.1.6(b) Investigation 3 memo

Investigation Rubric

Due Date : ……

Total Mark : 50

Name of learner **: ……**

Part1: Drawing a floor plan of your house

1.1

No measurements of the longest wall **(0)**	Shown the measurement of the longest wall **(2)**

1.2

No scale **(0)**	Incorrect scale **(1)**	Correct scale **(2)**

1.3

No measurement and conversion for all outside / inside wall **(2)**	There's measurement and conversion for both inside/ outside wall **(4)**

1.4

Nothing indicated on the plan **(0)**	Few rooms are indicated on the plan by making use of necessary keys **(2)**	All rooms are indicated on the plan by making use of necessary keys **(4)**

1.5

Nothing on the plan **(0)**	Only 1 dimension measured **(1)**	All dimensions measured: Length and width **(2)**

1.6

Nothing **(0)**	drawn only 2 cm between the tiles **(2)**	Drawn 2 cm between the tiles and 1 cm between tiles and the edge **(4)**

Part 2: Data collection

2.1

Nothing indicated **(0)**	Only mentioning without evidence **(2)**	Mentioning and evidence present **(4)**

2.2

Nothing indicated **(0)**	1 dimension of tile identified **(1)**	2 dimensions of a tile identified **(2)**

2.3

Nothing **(0)**	Mention how many tiles per packages **(2)**	Mentioning number of tiles per package with evidence as either diagram/ sample or quotation **(3)**

2.4

Nothing **(0)**	Only mentioning without evidence e.g. quotation **(1)**	Mentioning with evidence e.g. quotation **(2)**

2.5

Nothing **(0)**	Only number of grout bags mentioned **(1)**	Cost of grout is determined **(2)**	Cost of grout is determined for the total area needed to be tilled **(3)**	Cost of grout is determined for the total area needed to be tiled and evidence is attached e.g. quotation **(4)**

2.6

No rate **(0)**	Indicated the rate **(1)**	Indicated the rate and evidence e.g. quotation **(3)**

Part 3: Calculating cost

3.1

Nothing **(0)**	Correct number of packages **(2)**	Calculating the 10 % of breakages of tiles in a package **(3)**	Adding the 10% breakages to the total number of tiles on a package to get how many tiles will be needed in total **(4)**

3.2

Nothing **(0)**	Calculating the cost of grout needed **(5)**

3.3

Determining the area to be tiled **(2)**	Multiplying the area with the rate **(5)**

3.4

No addition **(0)**	Addition of some cost **(1)**	Added all the cost for tiling the required area **(2)**

6.2 Grade 11 Tasks

6.2.1(a) ASSIGNMENT 1

MARKS:50

ASSIGNMENT 1
QUESTION 1:

1.1 The basic working week in Neat Upholstery factory is 45 hours from Monday to Friday. Overtime during the week is 1½ times the basic hourly rate of R31, 50 per hour. On Saturdays they pay twice the hourly rate. Study the table below and answer the questions that follow:

Names	M	T	W	T	F	S
John Short	9	10	8	9	9	0
Marius Ball	10	11	10	9	10	0
Phillip Smart	11	10	10	11	9	4
Lwazi Nzomo	11	9	9	10	8	8

1.1.1 Does John Short qualify for overtime? Explain. (3)

1.1.2 How do you think management of Neat Upholsterers determine whether a person has worked overtime? Do you think this is a fair policy? (3)

1.1.3 Calculate the amount of overtime that Mr. P. Smart is supposed to receive for the week. (5)

1.1.4 Study his wage slip below and answer the questions that follow:

Payslip	NEAT UPHOLSTERERS	
Name: L. Nzomo		**Date:** 12-03-2016
		Amount
Basic Pay(45 hours)	45…hours × R 31,50…	1417.50
Overtime:	3…hours × R 47.25…	141.75
Saturday:	8…hours × R 63,00…	504.00
	GROSS PAY	**2063.25**
Authorised: … N. Eat…	Received: **… L. Nzomo …**	

(a) Show how the amount of R47, 25 was determined. (2)

(b) Mr. Nzomo feels that his wage was incorrectly calculated, verify his claim. (4)

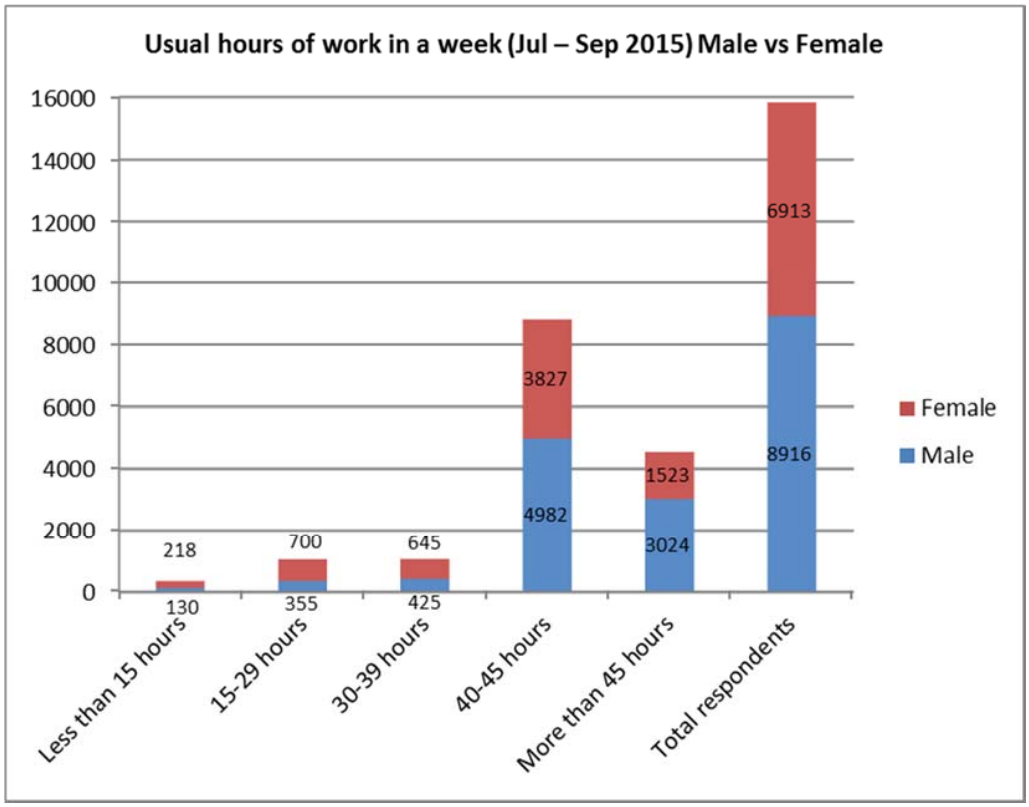
[17]

QUESTION 2:

2.1 Steven's Life Orientation group investigated whether there was a difference between the number of hours that men and women worked during a normal work week. They found some data in the Quarterly Labour Force Survey (3rd quarter 2015) as shown below.

Usual hours of work in a week (Jul – Sep 2015)		
Number of hours	**Male**	**Female**
Less than 15 hours	130	218
15-29 hours	355	700
30-39 hours	425	645
40-45 hours	4982	3827
More than 45 hours	3024	1523
Total respondents	8916	6913

Source: www.statssa.gov.za/publications/P0211/P02113rdQuarter2015



2.1.1 How many respondents were used in this survey? (2)

2.1.2 In what category of hours were there more females than men? (2)

2.1.3 What does the answer in 2.1.2 tell you about the data? (2)

2.1.4 Determine the percentages of both male and female respondents where respondents were working between 15 and 29 hours. Show all your workings (4)

2.1.5 If the average hourly rate for people working less than 15 hours per week is R30.25, and was calculated by using the following rates:

A	21.50	22.30	24.50	24.50	26.15
26.40	27.30	28.40	30.20	31.50	32.50
33.10	33.60	35.20	34.50	41.20	42.30

(a) What will the lowest hourly rate **(A)** be, if the average was calculated by using the data above? (3)

(b) Mbulelo is working at the highest rate in this category and worked for 14½ hours. What will his total wage be for that specific week? (2)

(c) Do you think it is fair if the average hourly rate of people working more than 45 hours is R22,50? Explain. (2)

[17]

QUESTION 3:

3.1 Siya bought a car with a capacity of 60 litres. He filled the petrol tank of his car with 53,62 litres of petrol when the odometer in his car showed 103 914 km. The next time he filled the tank it took 56,13litres and the odometer showed 104 323km.

3.1.1 How many kilometres did Siya travel between refuelling? (2)

3.1.2 How many litres of petrol did he use to travel this distance? (2)

3.1.3 On average, how many litres does his car use every 100km? (4)

3.1.4 The petrol price for the first quarter is shown in the table below: Study the table and answer the questions that follow:

PETROL - Pump price						
Date	Coastal		Inland			
	95 EPU/LRP	*Change*	93 EPU/LRP	*Change*	95 EPU*	*Change*
02 March 2016	R11.31	▼*29c*	R11.46	▼*69c*	R11.74	▼*69c*
03 February 2016	R12.00	▲*6c*	R12.15	▲*6c*	R12.43	▲*6c*
06 January 2016	R11.94	▼*3c*	R12.09	▲*0c*	R12.37	▼*3c*

Source: http://www.engen.co.za/home/apps/content/products_services/fuel_price/default.asp

(a) With how many cents did the price of petrol increase/decrease at coastal level on 2 March 2016? (2)

(b) How much did it cost him if he filled his tank the first time in Cape Town on 2 February 2016? (3)

(c) How much money would he have saved/paid more if he filled up his tank on 3 February 2016? (3)

[16]

6.2.1(b) Assignment 1 Memo

QUESTION 1:		Explanation of mark allocation	LEVEL
1.1.1	No. ✓ He only worked for 45 hours, which is a basic working week.✓ ✓	1A 2J (3)	L4
1.1.2	They add all the hours and if the time is more than 45 hours, you subtract that to determine the overtime. I do not think it is fair. ✓A person might work 15 hours on 1 day and not qualify although they work for more hours. ✓✓	1O 2J(3)	L3
1.1.3	51 – 45 = 6hours overtime 6 × R47,25✓ = R283.50✓ 4 × R63,00 ✓= R252✓ Total = R535.50✓	1M 1A 1M 1A 1CA(5)	L2
1.1.4(a)	R31,50 × 1,5✓ = R47,25✓	1M 1A(2)	L1
(b)	Total hours worked(Mon – Fri) 11+9+9+10+8 = 47✓ ∴ Normal hours = 45; Overtime(1½) = 2; Overtime(×2) = 8 hours✓ Normal = 45 × R31,50 = R1417,50 Overtime(1½) = 2 × R47,25 = R 94,50 Overtime(×2) = 8 × R63,00 = R 504,00 = R2016,00✓ His claim is invalid ✓	1M 1A 1CA 1J(4)	L3
		[17]	

QUESTION 2:			Explanation of mark allocation	Levels
2.1.1	8916 + 6913 = 15829 male respondents✓✓		2A (2)	L1
2.1.2	In the: “less than 15 hours”, “15-29 hours” and “30-39 hours” categories. ✓✓		2A (2)	L2
2.1.3	It shows that more of the female workforce is working fewer hours per week. ✓✓		2A (2)	L4
2.1.4	Male: $=\frac{355}{8916} \times \frac{100}{1}$✓	Female: $=\frac{700}{6913} \times \frac{100}{1}$✓	1M 1A 1M	L2

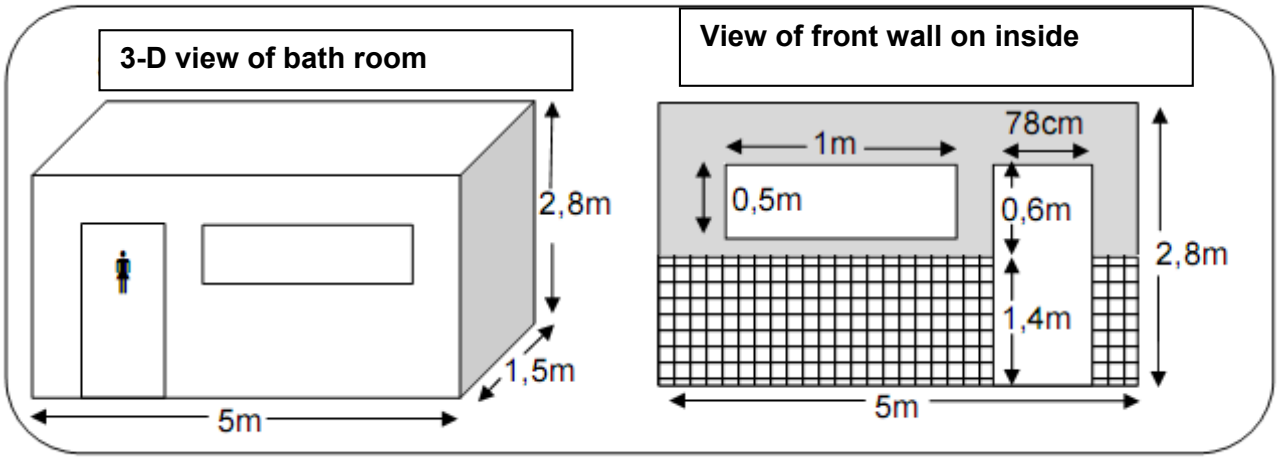
	= 3,98%✓	=10,13%✓	1A (4)	
2.1.5(a)	R30,25 × 18 = R544,50✓ R544,50 – (21,50 + 22,30+…+R42,30) ✓ R544,50 – R515,15 A = R29,35✓		2M 1A (3)	L3
(b)	R42,30 × 14,5= R613,35✓✓		2M (2)	L2
(c)	Fair. They are working more hours per day. Unfair. People are supposed to be paid for the amount of work that they do. ✓✓		2A (2)	L4
				[17]

QUESTION 3:		Explanation of mark allocation	Level
3.1.1	104323 – 103914✓ = 409km✓	1M 1A(2)	L1
3.1.2	56.13 kl✓✓	2A (2)	L1
3.1.3	$\frac{409}{100}=\frac{56}{l}$ ✓✓ *409l= 56 x 100*✓ *=13.68 l*✓	3M 1A (4)	L3
(a)	29c✓✓	2A (2)	L1
(b)	R11.31 x 53.62✓✓ = R606.44✓	1A for 53.62 1M 1CA(3)	L1
(c)	R12 x 53.62✓✓ =R643.44✓ He would save =R643.44 –R606.44✓ =R37.00✓	2MA 1A 1M 1CA	(5)
			[18]

6.2.2. ASSIGNMENT 2
MARKS:55

QUESTION 1
The grade 11 learners want to renovate their school's bath rooms. They decide to tile the bottom half of the inside walls and to paint the top half. The back and side walls have no doors or windows and the toilets are only installed after the painting and tiling has been finished. The wall on the front only has one window and one door.

- **Tiles are sold in boxes of 24 tiles per box and every box covers round about 1m².**
- **Round about 10% more tiles must be purchased to make provision for breakage.**
- **Patty's Paint Shop gave them a quotation for paint (see quotation).**
- **One litre of paint covers 6m².**



Patty's Paint Shop gave the following quotation for the paint:	
Patty's Paint Shop **5th Avenue nr 23, Noupoort**	
2 l *white paint*	R170.99
1 l *white paint*	R94.99

1.1 Calculate the areas of the back and side walls that must be tiled. The following formula may be used: (6)
Area of a rectangle = $l \times b$

1.2		Calculate the area of the bottom section of the front wall that must be tiled.	(4)
1.3		Calculate the total area that must be tiled	(2)
1.4		Calculate the number of boxes of tiles that must be purchased to tile the required area. To assist you to calcúlate the number of boxes of tiles needed, do the following calculations.	
	1.4.1	Number of tiles needed to calcúlate the total area.	(2)
	1.4.2	Number of tiles needed, including provisioning for breakage.	(3)
	1.4.3	Total number of boxes of tiles needed.	(2)
1.5		Calculate the areas of the back wall and the side walls that must be painted.	(4)
1.6		Calculate the area of the front wall that must be painted.	(5)
1.7		Calculate the total area that must be painted.	(2)
1.8		Calculate the total quantity of paint that must be purchased to paint the cloak room.	(3)
1.9		The contractor claims that the cost of the paint would be R350,00. Calculate the total cost of the paint based on Patty's quotation to prove whether he is right	(4)

[37]

QUESTION 2

Mr J. Davids is a government employee and the abbreviated salary advice below shows his monthly income and deductions. UIF is calculated as 1% of the gross salary.

Income	Amount	Deductions	Amount
Basic Salary	R14 100,00	Income Tax	R2 550,00
Housing Allowance	R900,00	Pension	R945,00
		Medical Aid	R1 430,00
		UIF	**B**
		Total deductions	**C**
Gross salary	**A**	Nett salary	**D**

2.1 Calculate the values of A,B,C and D respectively. (8)

2.2 Calculate the amount of UIF per month that must be paid over to the fund. (2)

2.3 His employer claims that the monthly deduction and contribution to the UIF should, after the increase below be R350,00. Show by means of calculations if he is right or wrong by determining the total monthly UIF amount that will be paid over to the fund if the employee's monthly basic salary increased by 7,5% and a monthly increase of R300,00 in the housing allowance was introduced by Government. Show all calculations (8)

[18]

6.2.2.(b) Assignment 2 Memo

6.2.2. Assignment 1 MEMO			
QUESTION 1:		Explanation of mark allocation	LEVEL
1.1	Area of back wall = 5m x 2,8mS✓F Area of the bottom half of back wall: = 14m² ÷ 2 = 7m²✓A **OR** Area of back wall to be tiled: = 5 m x 1,4✓SF = 7m²✓A Area of side walls to be tiled: = (2,8m x 1,5m)÷ 2 ✓SF = 2,1m² × 2 = 4.2m²✓A **OR** Area of side walls to be tiled: = 1,5m x 1,4m✓SF = 2,1m² × 2 = 4,2m²A✓ Total Area that must be tiled: = 7 + 4,2✓M = 11,2m²✓CA	1 SF Sub in Formula 1 Answer 1 SF Subs in Formula 1 Answer 1 SF Substitution 1 Answer 1 SF Subs 1 Answer 1 Method 1 CA Answer (6)	3
1.2	Area = 5 × 1,4 = 7m²✓A = 7m² – (1,4 x 0,78m) ²✓✓ = 5,908m² ≈ 5,91m² ✓CA **OR** Area = (5 - 0,78)× 1,4✓✓✓ = 4,22 × 1,4 = 5,908 ≈ 5,91m² ✓CA	1 Answer 1 Method 1 SF 1 CA Answer 1 C Converting to meters 1M Method(Subtracting 0,78) 1 SF Substituting into formula 1 CA (4)	3
1.3	Total area = 11,2 + 5,91m²✓ = 17,11m² ✓	1 Method 1 CA Answer (2)	1

1.4.1.	Number of tiles needed to cover the area = 17,11m^2 ÷ 1✓M = 17,11 m^2 ✓A	1 Method(÷1) 1 Answer (2)	2
1.4.2.	Number of tiles to be purchased including 10% allowance = 17,11 x 24✓M = 410,64 + 10% of 410,64) ✓M = 410,64 + (41,064) = 451,704 tiles✓CA	1 Method(×24) 1 M(+10% of) 1 CA (nr of tiles) (3)	2
	1.4.3 Total number of boxes required = 451,704 ÷24✓M = 18,82 ≈19 Boxes ✓R	1 Method (÷ 24) 1 Rounding (2)	2
1.5	Back wall area = 5m x 2,8m✓ = 14m^2✓ Back wall area to be painted = 14m^2÷ 2✓ = 7m^2✓ **OR** Back wall area = (5m x 1,4m) ✓M = 7m^2✓ A Side Walls = 2(1,5m x 1,4 m) ✓M = 4,2m^2✓A	1 Method 1 Answer 1 Method 1 Answer 1 Method (2,8÷2) 1 Answer 1 Method 1 Answer (4)	2
1.6	Area of front wall = 5m x 1,4m✓M = 7m^2✓A Area of wall to be painted =7m^2– ((1x0,5) ✓M+ (0,6 x 0,78)) ✓M = 7m^2 - (0,5 + 0,468) = 6,032m^2✓	1 Method 1 A Answer 1 Method(- area of window + 1Method(- area of door) 1 CA Answer (5)	3
1.7	Total area to be painted = 7 + 4,2 + 6,032✓M = 17,452m^2✓CA	1Method(Adding values) 1 CA Answer (2)	1
1.8	Paint needed = 17,232 ÷ 6m^2✓M = 2,872 litres✓CA ≈3 litres✓R	1 Method(÷6) 1 CA Answer 1 Rounding (3)	1
1.9	Total Cost of paint = 3l x R94,99✓M = R284,97✓CA **OR**	1 Method 1 CA Answer 1 Method	4

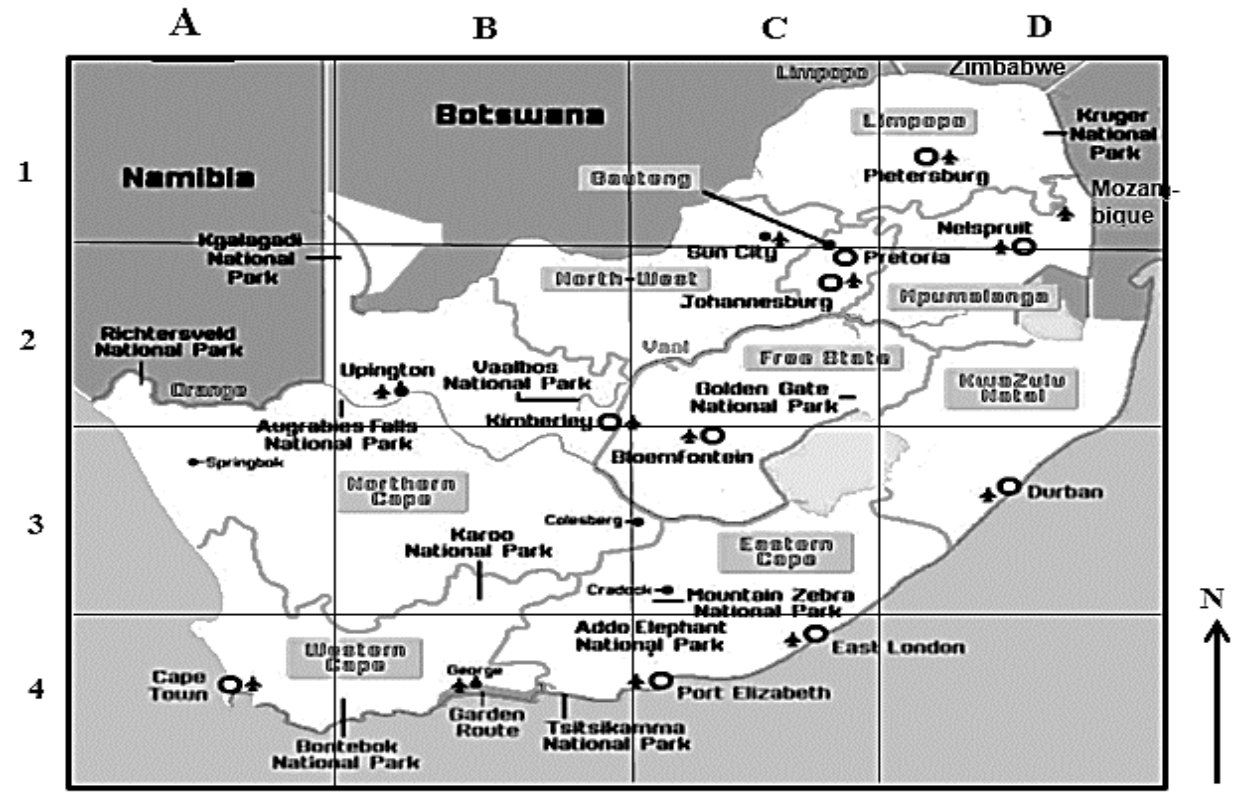
	Total Cost of paint = (2l R170,99) +(1l R94,99✓M = R265,98✓M No/Yes✓O – he is wrong, the paint costs less/more than R300,00✓J	1 Answer 1 Opinion + 1 Justification (4)	

QUESTION 2 18 Marks			
QUES			
2.1	A – R14 100 + R900✓ = R15 000 ✓ B – R15 000 x 1% ✓= R150 ✓ C – R2 550 + R945 + R1 430 + R150✓ = R5 075 ✓ D – R15 000 – R5 075✓ = R9 925 ✓ (8)	1 Method + 1Answer 1 Method + 1Answer 1 Method 1 CA Answer 1 Method 1 CA Answer	1
2.2	2(1% × 15000)✓ = R300 ✓ (2)	Method + 1 Answer	1
2.3	R14 100 x 7,5%✓ = R1 057,5✓ R14 100 + R1 057,5 = R15 157,50 ✓ R900 + R300 = R1 200 R15 157,50 + R1 200 = R16 357,50✓ R16 357,50 x 1% ✓= R163,58 x 2 = R327,16✓ No✓, he is wrong the correct amount should be R327,16✓ (8)	1 Method(×7,5%) + 1A 1 CA Answer 1 CA Answer 1 Method 1 CA Answer 1 Justification + 1 Reason	4

6.2.3.(a) Assignment 3

MARKS:50

1.1 Thandile uses the map of South Africa below to plan her trips between the different national parks. Use this map to answer the questions that follow.



1: 1000 000

1.1 Write down the grid reference for Kruger National Park. (2)

1.2 In which general direction is Cape Town from Durban? (2)

1.3 Which national park is situated in Free State? (2)

1.4 Thandile measured the distance from Sun City to Johannesburg on her map and found it to be 17,4 cm long. Use the given scale to calculate the actual distance in kilometres. (3)

1.5 It took Thandile 30 minutes to fly the distance of 192,4 kilometers between Pilanesberg National Park and Johannesburg. Calculate the average speed of the aircraft in kilometres per hour.

Use the formula: **Average speed =** $\frac{Distance\ travelled}{Time\ taken}$ (2)

[11]

QUESTION 2

2.1 The state of the main dams supplying the Cape Metropolitan area with water as compared to the five previous years is reflected in the table below.
The capacity is given in million cubic meters (million m^3).

TABLE 2: Water level of dams supplying water in the Cape Metropolitan area.

DAM	BULK STORAGE CAPACITY	% 2012	% 2013	% 2014	% 2015	**Current week 2016**	Previous week 8 Aug
WEMMERSHOEK	58,644	79.1	99.9	99.9	71.1	**69.1**	68.8
STEENBRAS LOWER	33,517	100.2	100.6	100.1	90.6	**64.1**	63.4
STEENBRAS UPPER	31,767	99.6	102.4	100.3	100.6	**99.6**	100.7
VOËLVLEI	164,095	73.6	94.8	99.9	49.5	**57.6**	55.3
THEEWATERSKLOOF	480,188	84	103.3	102.9	71.9	**50.2**	49.2
BERG RIVER	130,010	103.8	101.8	100.7	85	**64.5**	62.2
TOTAL STORED	898,221	770,625	908,922	912,967	641,009	**512,850**	501,397
% STORAGE		85.8	101.2	101.6	71.4	**57.1**	55.8

2.1 What does the word capacity mean? (2)

2.2 Determine the range of the capacity of these dams. (3)

2.3 Determine the median capacity of these dams. (3)

2.4 Which dam showed an increase in the water level from 2015 to 2016? (2)

2.5 Calculate, to the nearest million m^3, the current amount of water in the Berg River dam. (3)

2.6 Which dam's water level remained the most constant over this five year period? (2)

2.7 Which dam(s) show the largest percentage increase in water from the previous week to the current week? (2)

2.8 Calculate the average percentage decrease in the water levels of the Wemmershoek dam from 2014 to 2015. You may use the following formula:

Average percentage decrease = $\frac{difference\ in\ percentage\ from\ 2014\ to\ 2015}{percentage\ in\ 2014} \times 100\%$

(3)
[20]

QUESTION 3

3.1

The data in the following table (TABLE 3) is made available from the Electoral Commission of South Africa (IEC) with regard to the Election on 3rd August 2016. (http://www.elections.org.za and https://www.enca.com/south-africa/municipalelections-numbers)

TABLE 3

Number of voters per province	
Eastern Cape	3 161 535
Free State	1 418 288
Gauteng	5 937 471
Kwa-Zulu Natal	5 056 518
Limpopo	2 436 112
Mpumalanga	1 827 935
North West	1 651 242
Northern Cape	584 830
Western Cape	2 900 567
TOTAL number of voters	**A**

Refer to TABLE 3 and the graph of the Local Election Results questions below:

3.1.1 Calculate the total number of voters that voted nationally (Value A in table 3). (2)

3.1.2 Which province had the second highest number of voters? (2)

3.1.3 If 60% of the total voters were females, calculate the number of male voters in the 2016-election. (3)

3.1.4 Arrange the number of voters per province in ascending order. (3)

3.1.5 Calculate the percentage of votes in the 2016-election that went to “Other” in the National Results. (2)

3.1.6 Kwa-Zulu Natal is the only province where there was an increase in the number of voters for the ANC from the 2011-election to the 2016-election.

(a) If the percentage difference was 1, 20% and the number of voters were 5 056 518, calculate the number of voters who voted for the ANC in 2011. (3)

(b) Arrange the other 8 provinces in order of percentage decrease in the number of voters for the ANC. (4)

[19]

6.2.3.(b) Assignment 3 Memo

QUESTION 1:

		Explanation of mark allocation	LEVEL
1.1	D1 ✓✓	2RM	L1
1.2	South West / SW ✓✓	2M	L1
1.3	Golden Gate National Park. ✓✓	2RM	L1
1.4	**Option 1** Actual Distance = 174 x 1000 000 ✓ = 174 000 000 mm ✓ = 174 000 000 ÷1000 000 ✓ =174 km ✓ **Option 2** Actual Distance = 17,4 × 1000 000 ✓ = 17 400 000 cm ✓ = 17 400 000 ÷ 100 000✓ = 174 km ✓	1 M Multiplying 1CA 1M Divide by 1000 000 1A 1M Multiplying 1CA 1M Divide by 100 000 1A	L3
1.5	Average Speed = 192.4 ÷0.5 ✓✓ = 384.8 km/h ✓	1 SF 1 C Convert minutes 1 CA	L2
			[13]

Ques.	Solution	Explanation	Levels
2.1	Capacity is the total amount/quantity (of water) that can be contained / an empty container can hold. ✓✓	2J Explanation	L1
2.2	Range = 480 188 000 – 31 767 000 ✓✓ = 448 421 000 m^3 ✓ = 448,42 million m^3	1M Concept of Range 1SF Substitution 1CA Answer	L2
2.3	31,767 33,517 58,644 130,010 164,095 480,188 Median = (58,644 + 130,010) ÷ 2 ✓✓ = 94, 327 million m^3 = 94 327 000 m^3 ✓	1M Concept of median 1SF Substitution of correct values. 1CA Answer	L2
2.4	Voelvlei dam ✓	1A Answer	L1
2.5	Current amount of water = 64,5% × 130,010 ✓✓ = 83,85645 million m^3 = 84 million m^3✓	1RT Correct values 1M % Calculation 1R Rounding	L2
2.6	Steenbras Upper ✓	1A Answer	L1
2.7	Voelvlei Dam ✓ Berg River ✓	2A Answer	L1
2.8	✓ Average % decrease = $\frac{99,9 - 71,1}{99,9} \times 100\%$ ✓ = 28,828% = 28,83 % ✓	1RT Reading from a table 1SF Substitution 1CA Answer	L2
			[18]

Ques.	Solution	Explanation	Levels
3.1.1	3 161 535 + 1 418 288 + 5 937 471 + 5 056 518 + 584 830 + 2 436 112 + 1 827 935 + 1 651 242 + 2 900 567 = 24 974 498 ✓✓	2CA Answer	L2
3.1.2	Kwazulu Natal ✓✓	2RT Reading from Table	L1
3.1.3	% Male voters = 100% – 60% = 40% ✓ Number of male voters = 40% X 24 974 498 ✓ = 9 989 799,2 = 9 989 799 ✓	1M Calculating % Male voters 1M Method (Check answer from 3.1.1 above) 1CA Answer	L3
3.1.4	584 830 Northern Cape 1 418 288 Free State 1 651 242 North West 1 827 935 ✓✓✓ Mpumalanga 2 436 112 Limpopo 2 900 567 Western Cape 3 161 535 Eastern Cape 5 056 518 Kwa-Zulu Natal 5 937 471 Gauteng	3A Answer	L1
3.1.5	% of "Other" votes = 100% - (53,91% + 26,9% + 8,19% + 4,25%) ✓ = 100% - 93,25% =6,75% ✓	1M Subtracting from 100% 1CA Answer	L2
3.1.6(a)	Voters in 2011 = $\frac{100\% \times 5\,056\,518}{101{,}20\%}$ ✓ = 4 996 559,289 votes ✓ = 4 996 559 votes ✓	1M Calculation 1A Answer 1R Rounding	L3
3.1.6(b)	Gauteng 23,22% Western Cape 21,96% North West 19,77% Limpopo 14,97% Free State 13,34% ✓✓✓✓ Mpumalanga 9,31% Eastern Cape 8,53% Northern Cape 8,53% No level 4	1A for each two provinces arranged correctly. (Arrangement in ascending order Maximum 2 Marks)	L2
			[19]

MARKS:55

QUESTION 1

The grade 12 class of Mazibuko secondary school wants to sell "vetkoek" with a mince filling to generate funds for the matric farewell. The ingredients of the recipe for the mince filling as well as the prices they negotiated at the local supermarket are shown on the tables below. The total amount needed for the matric farewell planned for 100 learners and 5 Educators with their partners, is R60 000,00.

GRADE 12 CURRY MINCE FILLING FOR 50 VETKOEK'S

TABLE 1:

Ingredients for curry mince

3 large onions
2 kg mince
3 cups water
1½ teaspoons salt
¾ cup vinegar
4 large carrots (grated)
4 large potatoes (diced)
3 tablespoons apricot jam
2 tablespoons chutney
3 tablespoons sugar
1 teaspoon mild curry powder
1½ teaspoons hot curry powder
2½ tablespoons turmeric
1 packet Oxtail soup powder

TABLE 2:

Prices negotiated at a supermarket

Mince**:**	**R49** per kg
Carrots:	**R6 for 1 kg** (6 large carrots in 1 kg)
Potatoes**:**	**R30** for a 10kg pack (5 large potatoes in 1 kg)
Onions:	**R30** for a 10 kg pack (4 large onions in 1 kg)
Vinegar**:**	**R15** for a 2 litre bottle
	R8 for a 750 ml bottle
Sugar**:**	**R9** for a 1 kg packet

NOTE:

It will not be necessary to buy the following items, as they will be donated :(FREE)
Salt
Curry powder (hot and mild)
Turmeric

1 Carefully study the recipe on table 1 and the notes to answer the following questions:

1.1 How many milliliters of mild curry powder are needed? (2)

1.2 How many milliliters of chutney are needed? (3)

1.3 How many litres of water are needed? (4)

QUESTION 2

Study the prices given in table 2 above to answer the following questions:

2.1 How many potatoes are there in a 10 kg bag? (2)

2.2 How many onions are there in a 10 kg bag? (2)

2.3 Show by calculation that the recipe can be made twelve times (call this bulk) with a 10 kg bag of potatoes. Round down to the nearest integer. (3)

2.4 Now calculate the metric quantities of the following ingredients: carrots, potatoes, Apricot jam and sugar needed to make the recipe twelve times. (11)

2.5 The school provided the learners with R1500.00 to start their fundraising activity. Use annexure A to verify if this amount will be enough to buy all ingredients they need for the bulk recipe. (12)

QUESTION 3

3 The matric farewell is planned to be held at Indaba Conference Centre, and the Conference Centre is offering the following rates:

1. Venue costs R285, 00 per person (Meals included)
2. Décor costs R12000,00

The grade 12 learners will pay R285 per person for entry.

3.1 The learners sell 300 vetkoek every week for 12 weeks. They charge R10, 00 for each vetkoek. Calculate the profit they will make if the cost for each vetkoek is R3,80 (5)

3.2 Use the answer in 3.1 to determine if the money made is enough or not, to subsidize the farewell. If not give 3 possible ways of raising more income. (6)

3.3 Write down three facts of advice that you can give to other learners who would want to engage in a fundraising activity (5)

6.2.4.(b) Investigation 1 Memo

6.2.4. INVESTIGATION 1 MEMO:
MARKS:55

1.1	1 teaspoon ✓RT = 5 ml ✓A	L1	1 RT 1 A
1.2	2 tablespoons ✓RT = 2 × 12,5ml ✓M = 25ml ✓CA	L1	1 RT 1 M multiplication by 12,5 1 CA
1.3	3 cups ✓ = 3 × 250ml ✓M = 750ml ✓CA = 0,75litre ✓C	L1	1 RT 1 M multiplication by 250 1 CA 1 Converting to litre

2.5	**Carrots:** 8kg needed @ R6/kg Cost = 8 x R6 ✓**MA** = R48 ✓**CA** **Vinegar:** (2 litre and 250 ml) needed Buy 2 litre @ R15 and one 750 ml bottle Cost = R15 + R8 = R23 ✓**CA** **Chutney:** Buy 460g @ R13 = R13✓**A** **Soup powder:** 12 Packets needed Cost = 12 × R3 = R36 ✓**CA**	**L3 = 11** **L4 = 1**	1 Method with Accuracy 1 Accuracy 1CA 1 Accuracy 1CA 1 Accuracy 1 Accuracy

Q2	SOLUTION	TL	EXPLANATION
2.1	10 × 5 ✓MA = 50 potatoes ✓CA	L1	1 M multiplication 1 CA
2.2	10 × 4 ✓M = 40 onions ✓CA	L1	1 M multiplication 1 CA
2.3	50 ÷ 4 ✓MA = 12,5 ✓CA ≈ 12 (rounded down) ✓R	L1	1 MA 1 CA 1 Rounding
2.4	Potatoes: 12 × 4 ✓MA = 48 potatoes ✓A Metric quantity = 48 ÷ 5 potatoes/kg ✓ MA = 9,6 kg ✓CA Apricot jam: 12 ×3 tablespoons ✓MA = 36 tablespoons ✓A Metric quantity = 36 x 12,5 ml ✓MA = 450ml = 450g ✓CA Sugar: 12 × 3 ✓tablespoons = 36 spoons ✓A Metric quantity = 36 x 12,5 = 450ml = 450g ✓CA	L2	1 M multiplication by 4 1 A # carrots 1 MA division by 6 1 CA # kg 1 M multiplication by 4 1 A # potatoes 1 MA division by 5 1 CA # kg 1 A tablespoons 1 CA # ml (or g) Accept any one. [11]
	Potatoes: buy 10 kg@ R30 =R30✓**A** **Apricot Jam:** 450g needed Buy 900g tin =R15✓**A** **Sugar:** 450g needed Buy 1kg =R9✓**A**		1 Accuracy 1Method Accuracy 1 CA

	Mince: 12 x 2kg = 24Kg needed✓**MA** @49/kg Cost = R49/Kg x 24Kg = R1176 ✓**CA** **Onion:** @ R30 a bag = R30 **Total Cost for bulk recipe per week = R1380✓CA** **The money provided is sufficient✓O**		1 CA 1 Opinion / Reason **[12]**

Q3	SOLUTIONS	TL	MARKS
3.1	Income = 300 ×R10 ×12✓**MA** = R36 000 ✓**CA** Expenditure = [(R1380 ×12)+ (R3,80×300)]✓ **MA** **=** R17 700✓**CA** **Profit =** R36 000 - R17 700✓**M** **= R18 300✓CA**	L2 5	1 MA multiplication 1 CA 1 MA 1 CA 1M 1 CA
3.2	The funds raised are not sufficient to fund the matric farewell.✓ ✓✓ **J** The grade 11 learners can host other fundraising events namely: ❖ Fashion show/ Talent show. ✓**O** ❖ Cake sale. ✓**O** ❖ Raffle✓**O**	**L4** **6**	3 Justification 1 mark for each opinion x 3 **(any possible fundraising)**
3.3	❖ Have more than one type of fundraising✓**O** ❖ Divide learners into groups so you have more than one way of making income✓**O** ❖ Do not focus on one aspect all the time✓**O**	**L4** 5	1 Mark for each Opinion
	TOTAL		**54**

6.2.5.(a) Investigation 2

MARKS:50

INSTRUCTIONS AND INFORMATION

1. Carefully read the given scenario before answering the questions. Answer ALL the questions.

2. 2.1 Use ANNEXURE A to answer QUESTION 4. 6.

   Answer QUESTION 5.1.on the attached ANNEXURE B.

   2.2 Write your NAME and GRADE in the spaces provided on the ANNEXURE. Hand in ANNEXURE A and B with your ANSWER BOOK.

George, a businessman, lives in Gauteng. In one month he must travel to Cape Town to visit his three business sites. The first site is in Cape Town which is 9 kilometres from the airport, the second site is in Paarl and is 60 kilometres from the airport and the third site is in Bellville and is 30 kilometres from the airport. George visits one site per day, travels back to Gauteng and comes back the following day to visit another site.

In this **INVESTIGATION you will be required to advise George as to which of the two rental companies offers the cheapest rate** for each of the three days he will require a car to visit the sites.

George collected the following information from advertisements of car hiring companies at Cape Town International Airport.

Eezy Bucs Cars	**Budget Taxi service**
	
Only R10 per kilometre Power steering, radio and air condition. Car fully serviced	Convenient travelling for only R100 ***basic fee*** plus R5 per kilometre Power steering and radio. Car fully serviced

QUESTION 1

ANSWER THE FOLLOWING QUESTIONS.

1.1. What does the term ***basic fee*** mean as used in the advertisement? (2)

1.2. How many car hiring companies did George consult? (2)

1.3. Which car rental company offers the cheapest rate per kilometre? (2)

1.4. The formula used to calculate the cost of hiring a car from Eezy Bucs Cars is:

Cost (in Rands) = R10 x n, (where n is the number of kilometres travelled)

1.4.1. How much will George pay for the return trip to Paarl if he hires from Eezy Bucs Cars? (2)

1.4.2. The car that George used to Paarl has the fuel consumption rate of 5, 2 litres per 100 km. The cost of petrol on the day was R11, 90 per litre.

1.4.2.1 Calculate the cost of petrol for the trip to Paarl. (4)

1.4.2.2 Determine the profit Eezy Bucs Cars made from that trip (excluding wear and tear cost). (2)

Use the formula: Profit = Income – Cost

1.4.3 How many km must George travel to his site in Bellville? (2)

1.4.4 Write down a formula for calculating the cost of hiring from Budget Taxi service. (2)

1.4.5 It takes George 0, 45 hours to travel from the airport to Bellville, write the duration of his trip in minutes. (2)

	QUESTION 2	
2.1	The table below compares the hiring cost for the car hiring companies: Complete the table below.	(4)

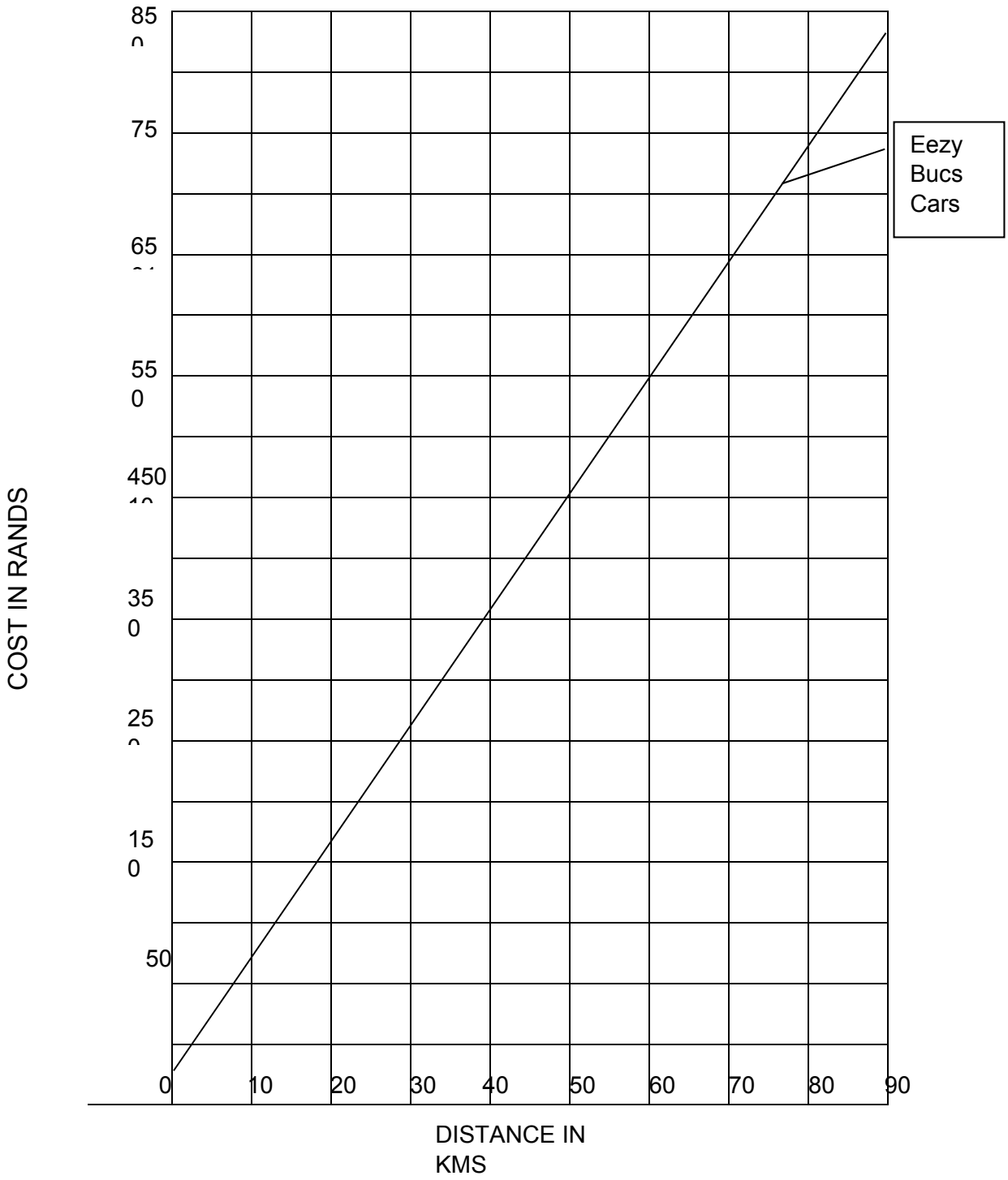
Distance (in Km)	0	10	20	30	40	50	60	70	80	90
Eezy Bucs Cars (cost in Rands)	0	100	200	300	400	500	600	700	800	900
Budget Taxi service (cost in Rands)	100				300					

2.2	The graph in Annexure A shows the graph representing the cost of hiring from Eezy Bucs Cars for different kilometres.	
2.2.1.	On the same set of axes draw the graph that represents the hiring costs from Budget Taxi service. Clearly label your graph.	(4)
2.2.2	On a certain day George hired a car from Budget Taxi services and paid an amount of R450. Use your graph to estimate the distance that George travelled on that day	(2)
2.2.3	If on the first day George decides to visit his uncle who lives 20 km from the airport before going for the site visit in Cape Town in the same direction, which of the two companies will be the cheapest option. Show your calculations to support your answer	(4)
2.3.	Name three other considerations that George must take into account before choosing a car hire.	(3)
2.4.	Using the graph, explain in your own words what is happening at 10 km, 20 km and 30 km respectively in terms of the cost. Provide a suitable **conclusion** that will help George in making his decision	(5)
2.5.	Give a reason why the graph for Budget Taxi service does not start at (0; 0), the origin.	(2)

2.6.	Use your **COMPLETED TABLE** or **GRAPH** to advise George on the **cheapest car hiring option** for each of his site visits.	(3)
2.7	George travels from his home to visit his three sites on three consecutive days. What advice can you share with George based on his **travelling arrangements** as mentioned earlier, and provide two substantial reasons for this advice.	(3)
		[50]

ANNEXURE A

GRAPH REPRESENTING THE HIRING COSTS OF EEZY BUCS CARS



6.2.5.(b) Investigation 2 Memo

MARKS:50

Questions	Solutions	Marks	Explanation	Levels
1.1.	Basic is the amount paid irrespective of the number of kilometres travelled✓✓J	2	J	TL 1
1.2.	Two✓✓A	2	A	TL 1
1.3.	Budget Taxi service ✓✓RD	2	RD	TL 1
1.4.1.	Eezy Bucs cost (Rands) = R10 x number of km = R10 x 60 x 2✓MA = R1200 ✓CA **OR** Eezy Bucs cost (Rands) = R10 x number of km = R10 x 120✓MA = R1200 ✓CA	2	MA- return distance CA - answer	TL 3
1.4.2.1.	Amount of petrol = $\frac{5,2\ l}{100km}$ x 120km ✓MA Amount of petrol = 6,24 litres ✓A Cost of petrol = 6,24 litres x R11.90 /*L* ✓M Cost of petrol = R74,26 ✓A	4	MA - multiplying by 120 A - amt. petrol M - multiplication A - cost	TL 3
1.4.2.2.2.	Profit = Income – Cost = R1200 – R 74, 26✓SF = R 1125,74 ✓A	2	SF - substitution A - answer	TL 2
1.4.3.	30 km✓✓A	2	A	TL1
1.4.4.	Budget: Cost(Rands) = R100 + R5 x number of km✓✓MA	2	MA	TL 2
1.4.5.	Duration = 0,45 x 60✓MA = 27 min✓A	2	MA A	TL1

1.4.6.	ANNEXURE A	4	A	TL2

QUESTION 2

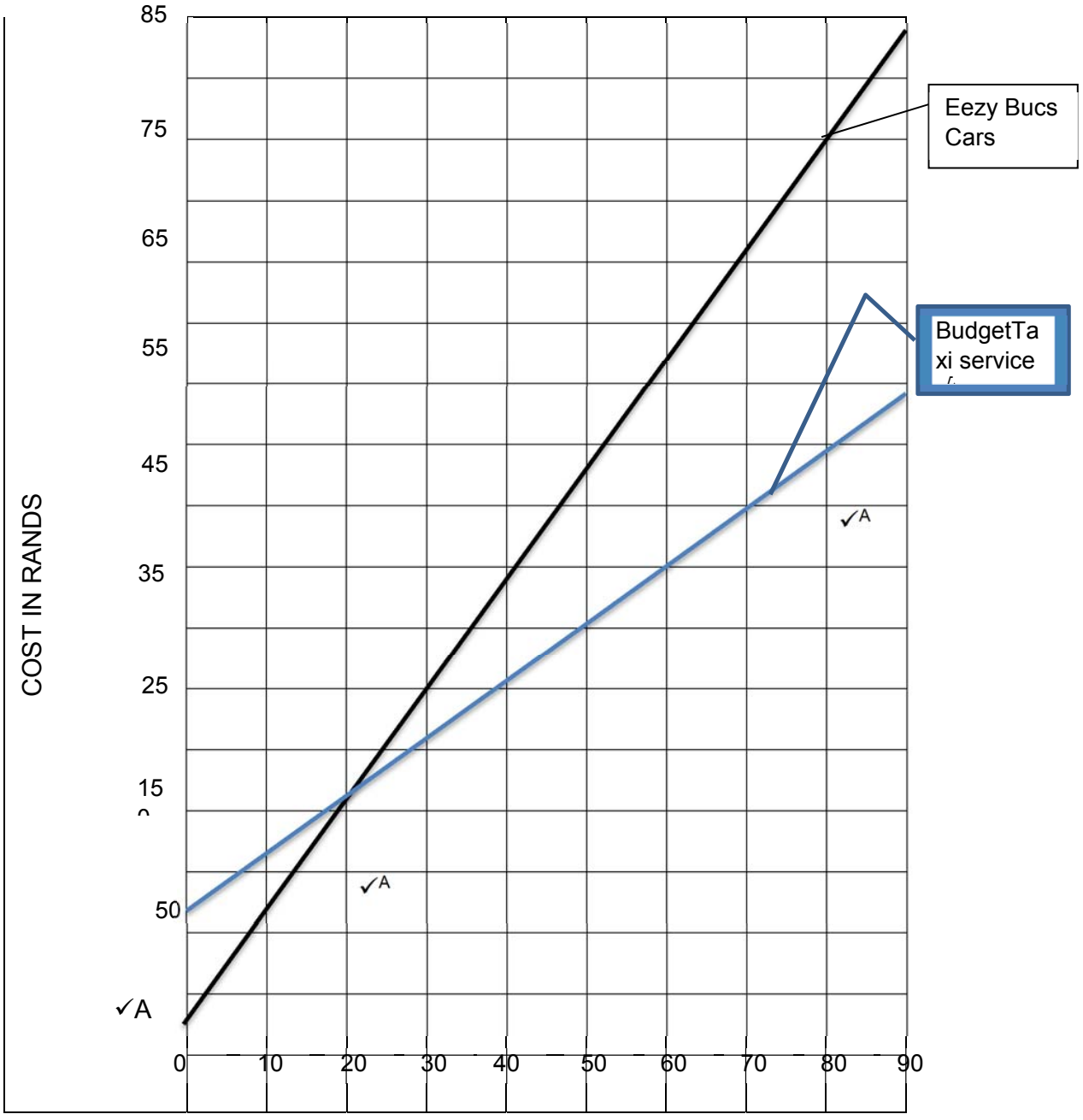
2.1.	For every 2 correct values, 1 A mark						4			TL2
Distance (in Km)	0	10	20	30	40	50	60	70	80	90
Eezy Bucs Cars (cost in Rands)	**0**	**100**	**200**	**300**	**400**	**500**	**600**	**700**	**800**	**900**
Budget Taxi service (cost in Rands)	**100**	150	200	250	**300**	350	400	450	500	550

Quest1.	Solution	Marks	Explanation of mark allocation	Level
2.2.1	See the graph on the annexure	4	1A for every 2 correct values	TL2
2.2.2.	51 -52 km ✓✓RG	2	A	TL 2
2.2.3	Budget Taxi service. ✓RG Total km = 20km + 11km = 31 km ✓A Budget Taxi = +/- R250,00✓RG Eezy Bucs = +/- R325,00✓ RG	4	A	TL 3
2.3	• Enough money✓ • Comfort ability of the car✓ • Safety of the car✓ • Beauty of the car • If the cars are available • Distance to travel • Brand of the car (name of the manufacturer)	3	O/ Any three valid reasons	TL 4
2.4	• At 10 km Eezy Bucs cars is cheaper than Budget Taxi. ✓J • At 20 km Eezy Bucs cars and Budget taxi service are charging the same amount ✓J • At 30 km Budget Taxi Service is cheaper than Eezy Bucs cars✓J • CONCLUSION: Eezy Bucs should be used for trips less than 20km but	5	J	TL 4

	Budget Taxi Service should be used for trips greater than 20km. ✓✓J			
2.5	• If you choose Budget Taxi, you have to pay the basic amount on top of the kilometres rates ✓✓O	2	O	TL 4
2.6	• For the Cape Town trip the cheapest option is Eezy Bucs Cars ✓RT • For the Paarl trip Budget Taxi service is the cheapest ✓RT • For the Bellville trip Budget Taxi service will be the cheapest ✓RT	3	RT - No other answer is acceptable	TL 2
2.7.	• George should find suitable accommodation after his visits to his sites. ✓O • This could save him a lot of money in his flight costs. ✓J • This would also allow him to rest because so much of travelling can cause fatigue. ✓J OR • George could take direct flights to his next site and then take up accommodation. ✓O • He will save on flight costs. ✓J • He will be more rested the next day. ✓J	3	J	TL4

ANNEXURE B

GRAPH REPRESENTING THE HIRING COSTS OF EEZY BUCS CARS



1 A for starting point

1 A for end points

1 A for point of intersection.

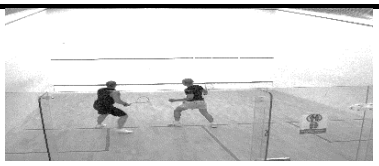
1 A mark for label.

MARKS:65

INVESTIGATION: Why are squash balls packaged in rectangular boxes?

Introducing the problem

Squash is a racket sport played by two or four players in a four walled court with a small, hollow rubber ball called a *squash ball*



N.B: *The following extra resources will be needed to complete this investigation: scissors; glue; A4 papers/cardboards, colouring pens and a ruler. The teacher can assist by bringing this for learners.*

Have you ever noticed that *squash balls* are often sold in rectangular boxes? This seems a bit strange given that squash balls are round (i.e. spheres) and so there must be lots of wasted space between the round ball and the rectangular box.

Throughout the remaining sub-sections below you are going to investigate the following question:

Would it not be more space and cost effective to package three squash balls in a cylindrical container rather than a rectangular box?

Picture source:

Part 1: The dimensions of a squash ball as measured

(No Marks- determine diameter to be used in the investigation)

The width of the ball across the middle of the ball

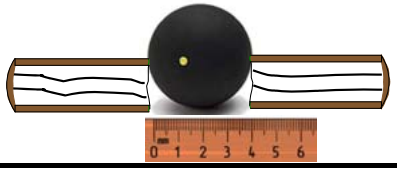
(i.e. the diameter of the ball)

Hint:

A good way to do this is to position the ball between two books and to measure the length of the gap between the books.

Findings:

A standard squash ball has a diameter of 40 mm (4 cm) and a radius of 20 mm (2 cm).



Part 2: Determining dimensions and building containers for the balls

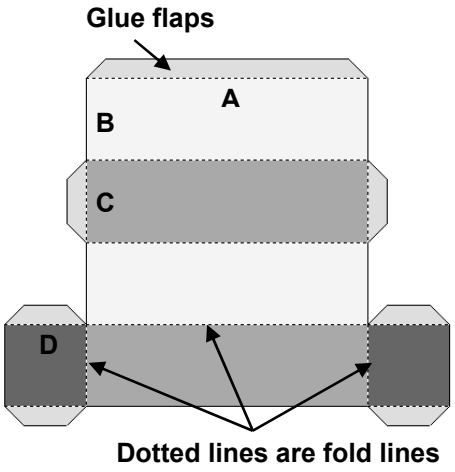
(Note: none of the pictures given below are drawn to scale)

2.1 The picture alongside shows a 3D view of a *rectangular box* used for packaging 3 squash balls.

Use the diameter value that you determined in Part 1 above to write down the dimensions of the height, width and length of this box, and explain how you have determined these dimensions

(4)

2.2 The picture alongside shows a 2-dimensional 'net' of what this box will look like when it is unfolded.



2.2.1 Write down the lengths / dimensions of the sides labelled A, B, C and D.

2.2.2 Redraw the net on a blank piece of paper or light cardboard. You must draw the net in 'real-size': i.e. according to the dimensions of what the rectangular box must be to fit three squash balls. Make the glue flaps 1 cm high.

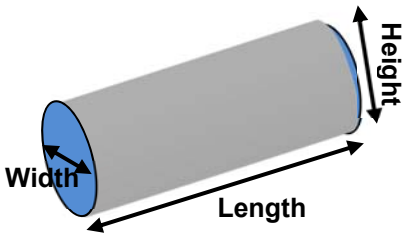
(4)

Now fold the net along the dotted lines and glue the flaps to the sides adjacent to the flaps to form a 3-dimensional box.

(Make sure that you don't glue the lid shut or you won't be able to get the squash balls inside.)

(6)

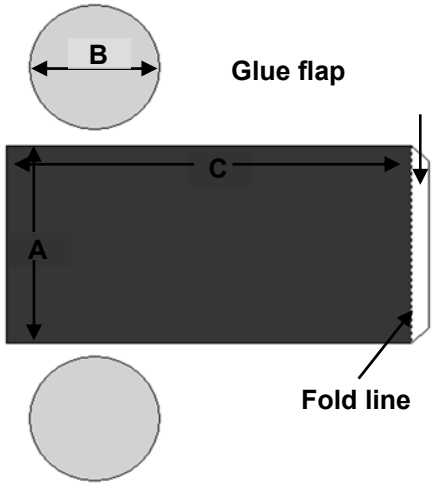
2.3 The picture alongside shows a 3-dimensional view of a *cylindrical container* that could be used for packaging 3 squash balls.
(Note: the cylindrical box will need to have a lid and a bottom or base so that the balls don't fall out)
What are the dimensions of the length, height and width of this cylindrical container?



(3)

2.4 The picture alongside shows a 2-dimensional 'net' of what this cylindrical container will look like when it is unfolded.

2.4.1 Which side of the cylinder – the length, width or height – does the side labelled 'A 'represent? Explain your answer and write down the dimension of side A. (2)



2.4.2 Write down the dimension (size) of the length indicated by the letter 'B'. (2)

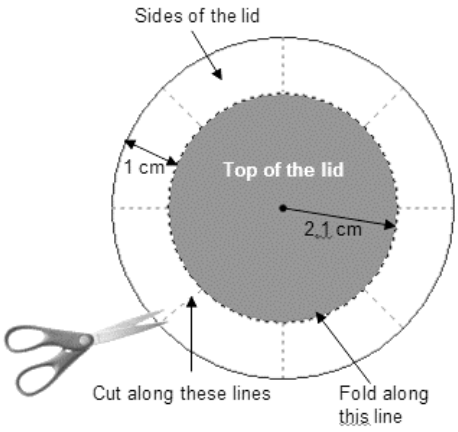
2.4.3 (a) The dimension indicated by the letter 'C' is the same as the *circumference* of the lid or base. Explain why this is the case. (2)

(b) Use the formula below to determine the circumference of the lid and, hence, the dimension of the side labelled as 'C'. Round off the answer to one decimal place: (2)

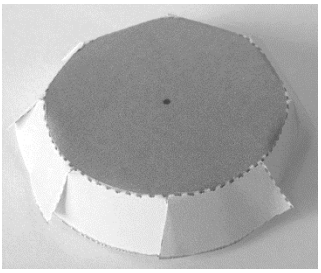
***Circumference* = π × *diameter* (where π =3,142)**

2.5 Redraw the net for the cylindrical container on a blank piece of paper or light cardboard and fold the net to make the container, according to the following instructions:

- You must draw the net in 'real-size', according to the dimensions for 'A', 'B' and 'C' above.
- Make the glue flap 1 cm wide.
- For the *lid* and the *base* of the container, use the 'net' alongside and cut, fold and glue as instructed to make the lid look like a lid for a cool-drink bottle.



(5)



2.6 2.6.1 Do you think the squash balls will fit easily inside the containers? Explain (2)

2.6.2 If you were to make the containers again, how could the dimensions of the containers be adjusted to get the balls to fit more easily? (2)

[30]

Part 3:

Comparing volumes :

3.1

3.1.1 What does it mean to talk about the 'volume' of the rectangular box or cylindrical container? (2)

3.1.2 Without doing any calculations, explain whether you think the rectangular or cylindrical box will have the greater volume. (2)

3.2 Determine the volume of the rectangular box for packaging 3 squash balls.

Use this formula: ***Volume of rectangular box= length × width × height*** (2)

3.3 Determine the volume of the cylindrical container for packaging 3 squash balls, using the following formula. Round off the final answer to 1 decimal place.

Volume of a cylinder = π × (radius of lid)^2 × length of cylinder (3)

3.4 Compare the volumes for the two containers and explain what the difference in volumes tells us about the amount of wasted or unused space in each container. (2)

Comparing surface areas:

3.5 What does it mean to talk about the 'surface area' of a box? (2)

3.6 Use the 2-dimensional picture of the 'net' of the rectangular box to calculate the surface area of that box. Show all workings. (5)

3.7 Use the 2-dimensional picture of the 'net' of the cylindrical container to calculate the surface area of that box. Show all workings. You may want to use the following formula for part of the calculation:

Area of a circle = π × (radius)^2 (7)

3.8 Based on your answers in 3.6 and 3.7 above, which container uses more material when constructed? Which container possibly costs more to manufacture (in terms of the quantity of material used only)? (2)

Which box shape would be the best choice?

3.9 Based on your answers in the questions above, would it make more sense:

- from a mathematical perspective
- in terms of optimal usage of space
- in terms of quantity of material needed

To package squash balls in a rectangular box or a cylindrical container? Explain. (2)

[29]

6.2.6. (b) Investigation 3 Rubric

MARKS:60

INVESTIGATION: WHY ARE SQUASH BALLS PACKAGED IN RECTANGULAR CONTAINERS

Part 1 :Overview			
Term	**Topic**	**Section(s)**	**Contents covered**
3	Measurement	Calculating perimeter, area and volume	Surface area and volume calculations
	Maps, plans and other representations of the physical world	Plans and models	Interpreting 2-D and 3-D diagrams Building models

Analysis Grid				
Distribution of marks	Taxonomy Level			
	Level 1	Level 2	Level 3	Level 4
Total marks (/60)	23	15	13	9
%	38%	25%	22%	15%
Expected %	30%	30%	20%	20%

Part 2: Determining dimensions and building containers (/32)			
Ques	**Solution**	**Level**	**Marks**
2.1.	Length = 3 × balls = 3 × 4 cm✓ = 12 cm✓ Width = 1 ball = 4 cm✓ Height = 1 ball = 4 cm✓	TL 1	4
2.2.1.	A = 12 cm✓; B = 4 cm✓; C = 4 cm; ✓D = 4 cm. ✓	TL 1	4
2.2.2	Redrawing the picture✓✓ Drawing using the correct dimensions✓✓. Folding to make a container. ✓✓	TL 2	6
2.3	Length = 3 × balls = 3 × 4 cm = 12 cm✓ Width = 1 ball = 4 cm✓ Height = 1 ball = 4 cm✓	TL 1	3
2.4.1	Side A represents the length with a measurement of 12 cm. ✓ i.e. If the cylinder is rolled up so that the glue flap is rolled around towards side A, then the side shown as A becomes the longest side of the cylinder. ✓	TL 2	2
2.4.2	4 cm (40 mm) ✓✓ → i.e. the same as the diameter of the ball.	TL 1	2
2.4.3(a)	When the cylinder is rolled up, the side labelled C will then fit along the edge of the lid or base of the cylinder✓✓.So, the length of side C is the same as the distance along the edge (i.e. circumference) of the lid/base.	TL 4	2

(b)	Circumference = π × diameter = 3,142 × 4cm✓ = 12,568 cm ≈ 12,6 cm✓	TL 1	2
2.5.	Redrawing the picture✓. Drawing using the correct dimensions. ✓✓ Folding to make a container✓✓.	TL 2	5
2.6.1	In all likelihood it means the balls will fit very tightly inside the different containers and it will be hard or impossible to close the lids on the containers properly. This is because the boxes were built using the exact dimension of the squash ball, so the boxes were built to fit the balls precisely. In order to allow for a bit of space so that the balls can fit more easily inside the containers, we should have worked with a slightly larger dimension than the exact dimension of the ball. ✓✓	TL 1	2
2.6.2	Adjusting the diameter of the ball to 4,1 cm or 4,2 cm would have created some extra space for the balls to fit more easily. ✓✓	TL 4	2

Part 3: Comparing volumes and surface areas (/28)

Ques	Solution	Taxonomy Level	Mark allocation
3.1.1.	The volume of a container refers to the amount of 3-dimensional space inside the container/ (or the amount of 3-dimensional space that the container occupies). It is also useful to think about volume as referring to the amount of liquid that can fit inside a container. ✓✓	TL 1	2
3.1.2.	Presumably the rectangular box: this is because when a rectangular container is developed for circular (spherical) balls then there is a large amount of wasted space in the box.√ If a cylindrical container is developed for the balls then there will be far less wasted space. As such, the rectangular box designed for packaging three squash balls should have a bigger volume than a cylindrical box designed for the same purpose. ✓✓	TL 4	2
3.2	Volume of rectangular box = length × width × height = 12 cm × 4 cm × 4 cm✓ = 192 cm^3✓	TL 1	2

	(*Note to teacher: make sure to remind learners that the answer must be expressed in units^3 because volume is being determined and because this involves working with three dimensions*)		
3.3	Volume of a cylinder = π × r ^{2} × length = π × (2 cm)^2 ✓× 12 cm✓ = π × 4 cm^2 × 12 cm = 3,142 × 4 cm^2 × 12 cm ≈ 151,3 cm^3✓	TL 2	3
3.4.	As predicted, the volume of the cylindrical container is smaller than the volume of the rectangular container✓.This suggests that there will be less wasted space in the cylindrical container when packaging three squash balls. ✓	TL 4	2
3.5.	The surface area of a container is the total area of all of the outside edges of the container✓. For a cardboard container, the surface area represents the *amount of material* used in making the container. ✓	TL 1	2
3.6.	Surface area of the rectangular box = (4 × area of side) + area of lid + area of base = 4 × (12 cm × 4 cm) ✓ + (4 cm × 4 cm) ✓+ (4 cm × 4 cm) ✓ = 192 cm^2 + 16 cm^2 + 16 cm^2 = 224✓ cm^2✓ (*Note to teacher: make sure to remind learners that the answer must be expressed in units^2 because area is being determined and because this involves working with two dimensions*).	TL 3	5
3.7.	Area of circular lid = π × (radius of lid)^2 = π × (2 cm)^2 ✓ = 3,142 × 4 cm^2 = 12,568 cm^2✓ Area of base = area of lid = 12,568 cm^2✓ Area of body of the cylinder = area of a rectangular = length of A × length of B (from the picture of the 'net') = 12 cm × 12,568 cm✓ = 150,816 cm^2✓ N.B: the length of B was calculated in 2.4.3 (b) Total Surface Area = 150,816 cm^2 + 12,568 cm^2 + 12,568 cm^2✓ = 175,952 cm^2✓	TL 3	7

	≈ 176 cm^2		
3.8.	The rectangular box has a greater surface area and so uses more material. ✓✓	TL1	2
3.9.	The cylindrical box has less wasted space and uses less material to make✓. Based on this, it seems logical that the cylindrical container is the more cost efficient container for packaging squash balls. ✓	TL 4	2

6.3 Grade 12 Tasks

6.3.1 (a) Assignment 1 **MARKS: 70**

QUESTION 1

Mr Pitsi and his children have won the cruise challenge that was meant to encourage healthy life style. The family that managed to win a race for 5 consecutive weeks qualified for the prize. Before they can go on their journey, they went to Dr Dhlomo, the local doctor for a check-up; as they will compete with other teams on the 8000m challenge when they come back. Use the chart below to answer the following questions:

BMI FOR AGE PERCENTILE RANGE	WEIGHT STATUS
$<$ 5th percentile	Underweight
5th to $<$ 85th percentile	Healthy
85th to $<$ 95th	Risk of overweight
$\geq$95th percentile	Overweight

Formula: BMI $= \frac{Weight}{Height^2}$ may be used.

1.1 Determine Thami's health status who is 14 years old, and his BMI is 21kg/m^2. (3)

1.2 What advise do you think Dr Nchabeleng will give Mr Pitsi about his son who is an 18 year old boy; and has the BMI of 17kg/m^2? Give 2 advices. (3)

1.3 Mr Pitsi claims that Pitso, his 15 year old son; who is 160cm tall and weighs 60kg is healthy. Verify his claim. (5)

1.4. 17 year old Thato is 170 cm tall and weighs 74.6kg.

1.4.1 Convert 170 cm to m. (2)

1.4.2 Determine the minimum weight he has to loose in order for his weight status to be classified as healthy if her ideal BMI should be 24.7kg/m^2. (3)

[16]

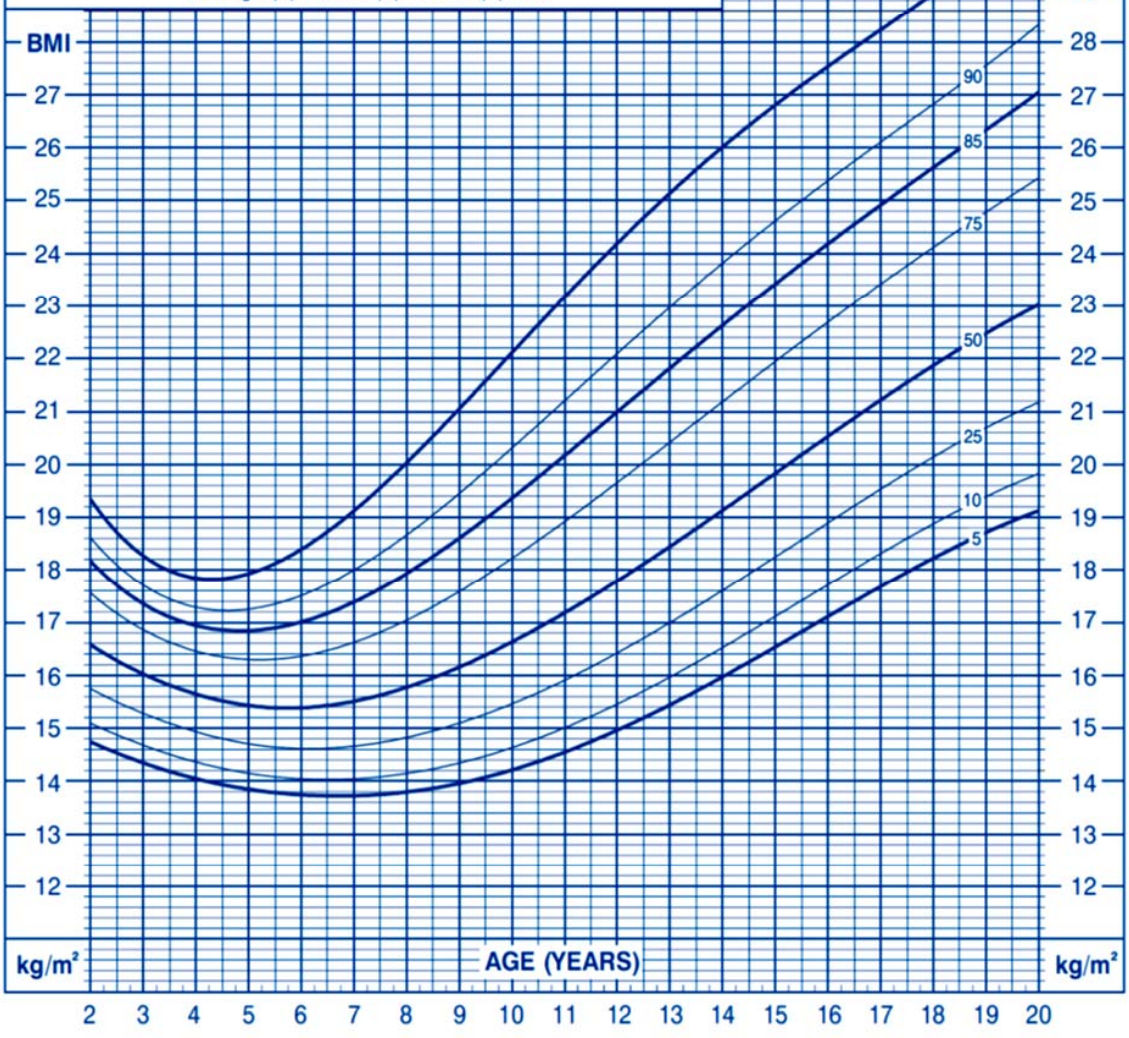
2 to 20 years: Boys
Body mass index-for-age percentiles

NAME _____

RECORD # _____

Date	Age	Weight	Stature	BMI*	Comments

***To Calculate BMI**: Weight (kg) ÷ Stature (cm) ÷ Stature (cm) x 10,000
or Weight (lb) ÷ Stature (in) ÷ Stature (in) x 703



Published May 30, 2000 (modified 10/16/00).

SOURCE: Developed by the National Center for Health Statistics in collaboration with the National Center for Chronic Disease Prevention and Health Promotion (2000).
http://www.cdc.gov/growthcharts

CDC
SAFER · HEALTHIER · PEOPLE™

QUESTION 2

Mr. Kekana, a 45-year old male; is a financial consultant at Tshelang debt clinic, he receives a gross salary of R30 510.65 and an annual bonus equivalent to his gross salary. He contributes 7.5% of his basic monthly salary towards a pension fund (but not from his annual bonus). He registered as an official doner and donates 10% of his gross salary to Thusanang orphanage. He also pays medical aid for his 3 children. His wife was employed in March 2015 and pays her own medical aid.

Use the tax table below to answer the following questions.

2.1	What is the maximum amount that a 67 year old person has to earn in 2016; before he is liable to pay tax?	(2)
2.2.1	Calculate his annual income, excluding bonus.	(2)
2.2.2	Calculate his annual pension fund contribution.	(2)
2.2.3	How much does he contribute to the orphanage per annum?	(2)
2.2.4	Determine the annual taxable income.	(3)
2.3	Calculate his monthly income tax payable for the year ending 28 February 2016.	(7)
2.4	If Mr Kekana was 20 years, determine how much tax he was going to pay.	(3)
2.5	He confronted his manager to complain about the escalating tax, as he did not get an increment since last year. Show by calculations if his statement is true.	(6)

[27]

Tax rates (year of assessment ending 29/02/2016)

Tax brackets	Taxable income	Rate of tax (in rand)
A	0 – 181 900	18% of taxable income
B	181 901 – 284 100	32 742 + 26% of income above 181 900
C	284 101 – 393 200	59 314+31% of income above 284 100
D	393 201 – 550 100	93 135+36% of income above 393 200
E	550 101 – 701 300	149 619+39% of income above 550 100
F	701 301 and above	208 587 +41% of income above 701 300

Tax rates (year of assessment ending 28/02/2015)

Tax brackets	Taxable income	Rate of tax (in rand)
A	0 – 174 550	18% of taxable income
B	174 551– 272 700	31 419 + 25% of income above 174 550
C	272 701– 377 450	55 957+30% of income above 272 700
D	377 451– 528 800	87 382+35% of income above 377 450
E	528 801– 673 100	140 074+38% of income above 528 800
F	701 301 and above	195 212 +40% of income above 673 100

Tax Rebates	2016	2015
Primary	R13 257	R12 726
Secondary(65 years to less than 75 years)	R7 407	R7 110
Tertiary (75 years old and above)	R2 466	R2 367

Tax Threshold	2016	2015
Primary	R73 650	R70 700
Secondary(65 years to less than 75 years)	R114 800	R110 200
Tertiary (75 years old and above)	R128 500	R123 350

Medical aid credits in respect of monthly contributions		
Tax Rebates	**2016**	**2015**
Tax payer only	R270	R257
First dependant	R270	R257
Additional dependants	R181 each	R172 each

QUESTION 3

Mr and Ms James used the bank calculator to investigate different bond repayment options over a 20-year period.

The quoted interest rate for the bond is 10,5%

They need to borrow R786 000.00. The bank calculator indicated that their minimum combined monthly gross income should be R 26 157.55 to qualify for a loan of this amount.

They also looked at the effect of paying an optional, additional monthly amount towards their bond. An adjusted summary of the results is reflected in the table below.

Use the table and the information above to answer the questions that follow:

	Amounts in Rand			
	Minimum Monthly Payment	**Additional Payment 1**	**Additional Payment 2**	**Additional Payment 3**
Additional Payment	0.00	500.00	800.00	1 000.00
Monthly Repayment	7 847.27	8 347.27	8 647.27	8 847.27
Loan Amount	786 000.00	786 000.00	786 000.00	786 000.00
Total Interest	1 097 343.82	878 136.99	788 622.23	739 537.26
Interest Saved	0.00	**A**	308 721.59	357 806.56
Total	1 883 343.82	1 664 136.99	1 574 622.23	1 525 537.26
Loan Term	240.0	200.0	183.0	173.0

Source: Adjusted from FNB Bank calculator – 21-06-2016

3.1 Determine the :

3.1.1 Total interest payable if they make an additional payment of R500.00 per month. (2)

3.1.2 Total payable amount if they choose additional payment 3. (2)

3.1.3 Minimum monthly bond repayment for this loan. (2)

3.2 The total amount payable over 240 months is R1 883 343.82.

3.2.1 Show how this amount was determined. (2)

3.2.2 Provide a possible explanation for the difference in the total value. (2)

3.3 Calculate the value of **A,** the total amount that they will save in interest if they pay an additional amount of R500 towards the bond every month, compared to just paying the minimum amount. (2)

3.4 If they make an additional payment of R1000 per month, they will be able to repay their bond in 173 months. The amount that they will repay in the last month will differ from the other months. Calculate the last repayment to the nearest rand. (5)

3.5 Ms James earns an annual gross income of R140 163.00. Her husband earns a gross income which is 26,4% higher than her income.

3.5.1 Calculate Ms James' monthly income. (2)

3.5.2 Calculate Mr James' monthly income. (2)

3.5.3 Show by calculation that their joint income qualifies them to get the bond. (2)

[23]

Question 4

Mrs Maharaj started a business where she manufactures traditional wedding jewel items on order. Payment is made in advance.

- The material required to manufacture one item costs R55.00
- She sells each item for R120.00.

She needed R 4 000.00 to purchase the equipment that she required to start her project. (This amount excluded the material which is used to manufacture the actual jewel items). However, there was no money in her new business account, hence she applied for a R8 000.00 *overdraft** facility which was approved by the bank.

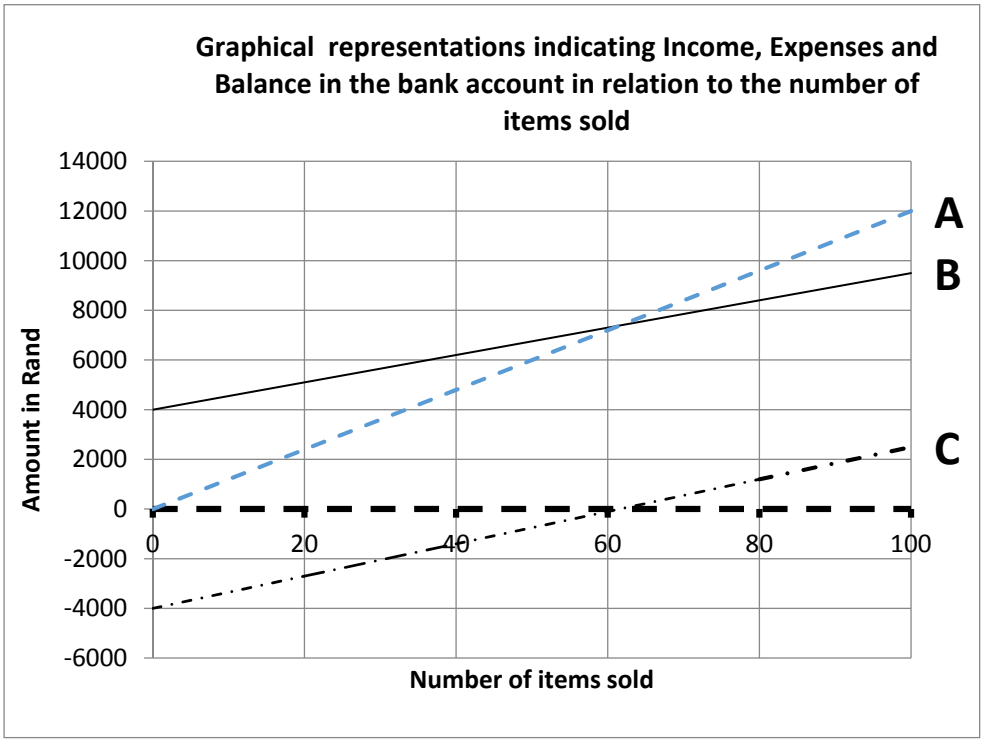
An **overdraft is an extension of credit from a lending institution when an account reaches zero. An overdraft allows the individual to continue withdrawing money needed up to the maximum amount granted, and to pay back in instalments as agreed with the bank.*

4.1 Determine the percentage profit that Mrs Maharaj makes on each jewel item that she sells.

Use the formula

Percentage profit = $\frac{selling\ price - cost\ price}{cost\ price} \times 100\%$ (2)

4.2 Below is a set of graphs which reflect the status of some of the financial components of Mrs Maharaj's project:



4.2.1 Which of the graphs A, B or C, represents **Income from sales**? (2)

4.2.2 If Mrs Maharaj's expenses amounted to R8 000.00. How many traditional wedding jewel items did she manufacture? Identify and use the graphical representation for the **Expenses** to find an estimated number of items. (2)

[6]

6.3.1 (b) Assignment 1 Memo

Ques	Solution	Explanation		TL
1.1	Her BMI is between the 50th and the 75th percentile□ ∴ She is healthy□ □	1A correct percentiles 2J for status	(3)	L2
1.2	His BMI is less than the 5th percentile□ • Nutrition□ • Health screen□	1A correct percentiles 2O , 1 per advise	(3)	L4
1.3	160cm = 1.6m□ BMI =$\frac{\text{weight}}{\text{Height}^2}$ = $\frac{60}{1.6^2}$ □ = 23.44 kg/m^2□ Her BMI is between the 75th and the 85th percentile.□□ ∴ Her claim is valid, as she is healthy.□□	1C conversion 1SF correct values 1A correct answer 1CA correct percentile 1O correct opinion	(5)	L4
1.4.1.	170cm/ 100 = 1.7m□□	2C converting to m	(2)	L1
1.4.2	24.7 kg/m^2 =$\frac{\text{weight}}{1.7^2}$□ Weight = 71.1kg□ Weight to be lost = 74.6 kg – 71.1 kg = 3.5 kg□	1SF correct values 1A answer 1CA for the difference	(3)	L2
			[16]	

Q4	Solution	Explanation		TL
2.1	R114 800	2RT	(2)	L1
2.2.1	Annual salary = R30 510.65 x 12✓ = R366 127.80✓	1M multiplying by 12 1A correct answer	(2)	L1
2.2.2	Pension fund = 7.5% of R366 127.80✓ = R27 459.59✓	1M multiplying by7.5% 1A correct answer	(2)	L1
2.2.3	Donations = 10% of R30 510.65 ✓ = R3051.07✓	1M multiplying correct values 1A answer	(2)	L1
2.2.4	Annual taxable income = (R366 127.80 + R30 510,65) ✓ – (R27 459.59 + R3051.07)✓ =R396 638.45 – R30 510.66 =R366 127.79✓	 1M adding bonus 1M subtracting both values 1CA answer	3)	L2
2.3	Income tax before rebates =59 314+31% of income above 284 100✓ =59 314+31% of (366 127.79 - 284 100) ✓ =59 314+0.31(82 027.79) =59 314 + 25 428.61 =R84 742.61✓ Medical credits =[(R270 x 2) + (R181 x 2)] x 12✓ =R10 824✓ Payable tax = R84 742.61–rebates-medical credits = R84 742.61- R13 257- R10 824✓ = R60 661.61✓	 1F correct formula 1SF correct values 1A correct answer 1M correct values 1A correct answer 1M subtraction 1A correct answer	(7)	L3
2.4	Payable tax = R60 661.61- R7 407✓ = R53 254.61✓✓	 1M subtraction 2A correct value	(3)	L4

2.5	Income tax before rebates =55 957+30% of income above 272 700 ✓ =55 957+30% (366 127.79 - 272 700) ✓ =55 957 + 0.3 (93 427.79) =55 957 + 28 028.34 = R83 985.34✓ Medical credits =[(R270 x 2) + (R181 x 3)] x 12 =R12 996✓ Payable tax = R83 985.34 – rebates-medical credit = R83 985.34 - R12 726 - R12 996 = R58 263.34✓ His statement is true as the tax for 2016 is more than for 2015. ✓	 1F correct formula 1SF correct values 1A correct answer 1A correct answer 1A correct value 1J conclusion	(6)	L4
			[27]	

Q4	Solution	Explanation		TL
3.1.1	Total interest payable = R 878 136.99	2RT – correct answer	(2)	
3.1.2	Total payable amount = R1 525 537.26	2RT – correct answer	(2)	
3.1.3	Minimum Monthly Repayment = R7847.27✓✓ RT	2RT – correct answer	(2)	L2
3.2.1	R 7847.27 × 240 ✓ M/A = R 1 883 344,80 ✓ CA (Value in table - R1883343.82)	1M- Multiply correct values 1CA- Follow up correct	(2)	L2
3.2.2	The decimals in the interest may have that effect ✓✓ J **OR**	2J – supply a valid reason which will fit into context	(2)	L4

	The last payment is adjusted to settle the repayment in full✓✓J			
3.3	Interest Saved = 1097343.82 - 878136.99✓M = R219 206,83✓1A	1M- determine difference 1A correct answer	(2)	L2
3.4	The total payment if all instalments are same = R 8 847.27 × 173 ✓M = R 1 530 577.71 ✓A Total Paid(bond calculator) = R1525537.26 Difference = R5 040,45 ✓CA Last instalment is R8 847.27 – R5 040.45✓M = R3 806.80 ≈ R3 807 ✓ CA	1M- multiply by 173 1A – correct answer 1CA – difference between calculated and value in table 1M –determine CA difference 1CA answer	(5)	L3
3.5.1	Her salary = R140 163.00 ÷12✓ = R11 680.25✓A	1M dividing by 12 1A – correct monthly salary	(2)	L1
3.5.2	His salary = R11 680.25 ✓×126,4%✓ = R14 763.83 ✓A	1M – adding 26,4% 1A – Male salary	(2)	L1
3.5.3	Income = R11 680.25+ R14 763.83 = R26 444.08✓CA	2CA- Total income	(2)	L1
			[23]	

Q4	Solution	Explanation		TL
4.1	Percentage profit = $\frac{120-55}{55} \times 100\%$ ✓ = 118,18% ✓	**1SF**-substituting correctly into given formula **1A**-correct answer	(2)	L2
4.2.1	**A** represents income from sales. ✓ ✓	**2A**-identifying correct graph.	(2)	L4
4.2.2	(Accept values from 71 to 75) ✓✓ She would have created approximately 73 items.	**3RG** - selecting approximate number of items	(2)	L2
			[6]	

6.3.2 (a) Assignment 2 **MARKS 60**

QUESTION 1

1.1 The table below shows a time table for a bus service running from Pretoria to Durban

The table shows a timetable for a bus service running from Pretoria to Durban.

PRETORIA – JOHANNESBURG – DURBAN							
Bus Number		**Gjd0830**	**Gjd1100**	**Gjd1400**	**Gjd1600**	**Gjd2200**	**Gjd2300**
		Mon & Wed	**Tues**	**Wed & Fri**	**Thurs, Fri & Sun**	**Sat & Sun**	**Sun**
Pretoria	Dep	06h15	09h30	12h30	15h00	20h30	21h30
Midrand	Dep	06h50	09h50	12h50	15h20	20h50	21h50
Johannesburg	Dep	08h30	11h00	14h00	16h00	22h00	23h00
Vereeniging	Dep	–	11h50	–	–	–	–
Harrismith	Dep	11h40	14h40	17h10	19h10	01h10	02h10
Swinburne	Arr	12h00	15h00	17h30	19h30	01h30	02h30
Swinburne	Dep	12h30	15h30	18h00	20h00	02h00	03h00
Estcourt	Dep	–	–	19h15	–	–	–
Howick	Dep	14h30	–	–	–	–	–
Pietermaritzburg	Dep	15h00	17h50	20h20	22h00	04h30	05h00
Pinetown	Dep	–	18h45	–	–	–	–
Durban Station	Dep	16h25	19h10	21h40	23h10	05h40	06h10
Durban Beach	Arr	16h40	19h25	21h55	23h20	05h55	06h25
Bus Number		**Gdj0800**	**Gdj1100**	**Gdj1400**	**Gdj1600**	**Gdj2200**	**Gdj2300**
		Tues & Thurs	**Wed**	**Thurs & Sat**	**Sat**	**Mon & Tue**	**Mon**
Durban Beach	Dep	07h15	10h15	13h15	15h15	21h15	22h15
Durban Station	Dep	08h00	11h00	14h00	16h00	22h00	23h00
Pinetown	Dep	–	11h25	–	–	–	–
Pietermaritzburg	Dep	09h15	12h30	15h10	17h00	23h00	23h55
Howick	Dep	09h45	–	–	–	–	–
Estcourt	Dep	–	–	16h30	–	–	–
Swinburne	Arr	11h45	15h00	17h30	19h30	01h30	02h30
Swinburne	Dep	12h15	15h30	18h00	20h00	02h00	03h00
Harrismith	Dep	12h35	15h50	18h20	20h20	02h20	03h20
Vereeniging	Dep	–	18h25	–	–	–	–
Johannesburg	Dep	15h45	19h30	21h30	23h00	05h00	06h00
Midrand	Dep	16h05	19h50	21h45	23h20	05h20	06h20
Pretoria	Arr	16h30	20h10	22h05	23h45	05h45	06h45

1.1.1 The top half of the table shows where the bus will stop on the route from Pretoria to Durban. What information does the bottom half of the table show? (2)

1.1.2 On what days of the week does the bus Gjd0830 travel from Pretoria to Durban? (2)

QUESTION 2

The following table shows the distance from Durban to the different towns.

Town	BL	CT	EL	G	JHB	K	PE	P
Distance (in km)	634	1753	674	854	588	811	984	646

2.1 Arrange the distances in ascending order (2)

2.2 Calculate the mean distance (3)

2.3 Find the median distance (3)

2.4 Use the provided annexure to draw a bar graph representing the distances from Durban to the various towns. (4)

[12]

QUESTION 3

Thabo who stays in Pretoria got a new job as a technician in Durban. He intends to travel from Pretoria to Durban using a bus. He therefore investigated the cost of travelling from Pretoria to Durban using a bus through internet. He tabulated his findings as follows:

INTERCAPE 	Pretoria to Durban One-Way approx: R 270 - R 550 Departs Pretoria 4 times a day approx. 8hrs 40min (616 km)
GREYHOUND 	Pretoria to Durban One-Way approx: R 340 - R 450 Departs Pretoria 5 times a day approx. 8hrs 30min (675.5 km)

CITILINER	Pretoria to Pietermaritzburg One-Way approx..: R 350 - R 480 Departs Pretoria once daily approx. 7hrs 37min (591.9 km) Pietermaritzburg to Durban One-Way approx..: R 190 - R 250 Departs Pietermaritzburg 5 times a day approx. 1hrs 04min (79.8 km)

Source: www.rom2rio.com/s/Pretoria/Durban

3.1 Give a possible reason why the bus prices were given as a range. (2)

3.2 What does "Departs Pretoria 4 times a day" mean in this context (2)

3.3 If Thabo decides to use Citiliner from Pretoria to Durban on a cheapest option.

3.3.1 Approximately how much will he pay? (2)

3.3.2 At what time will he arrive in Durban if Citiliner leaves Pretoria at 9:00? (3)

3.4 Why does each company reflect a different distance from Pretoria to Durban? (2)

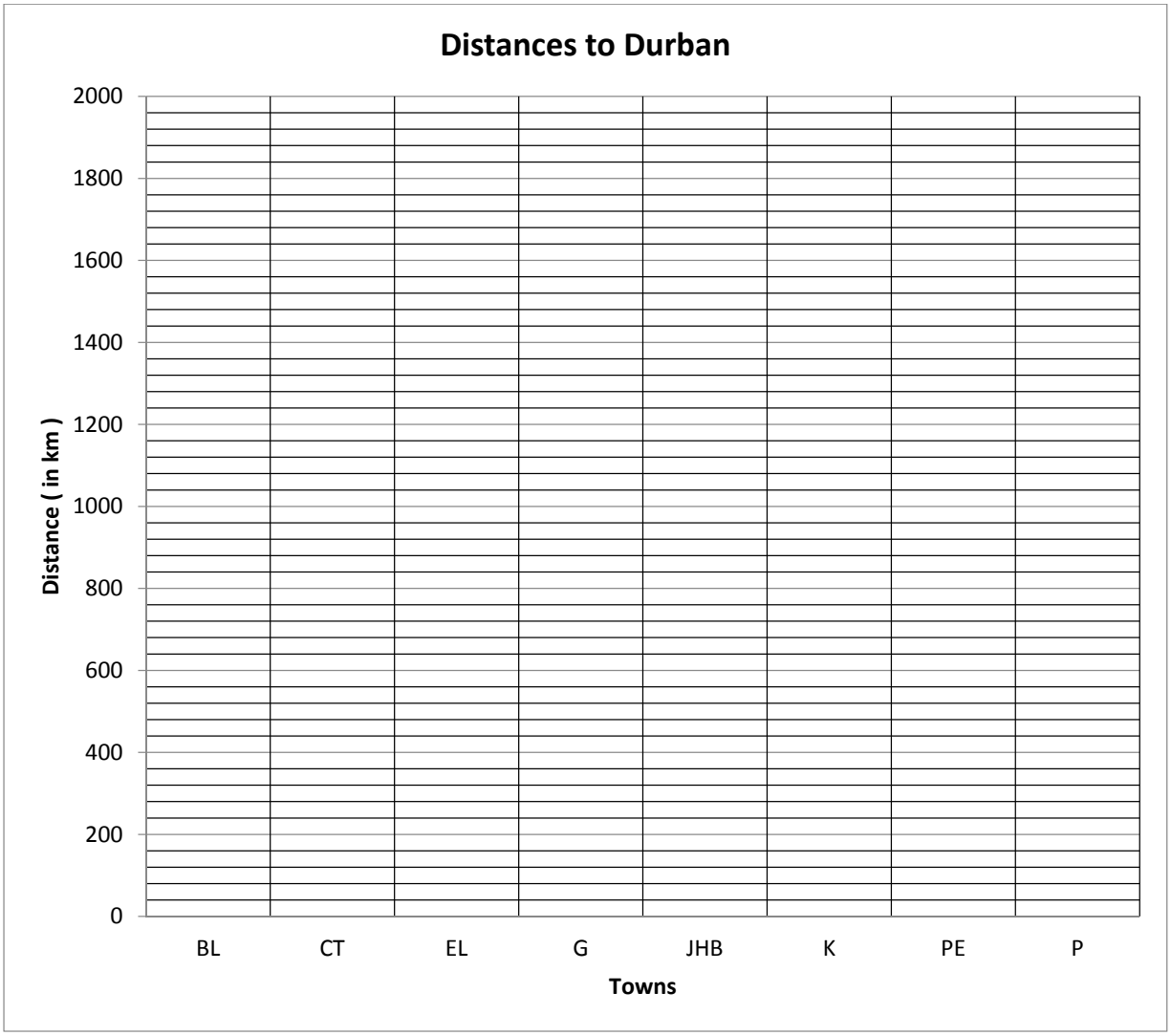
[11]

TOTAL: 60

ANSWER SHEET A

NAME OF LEARNER: _____

QUESTION 2.4



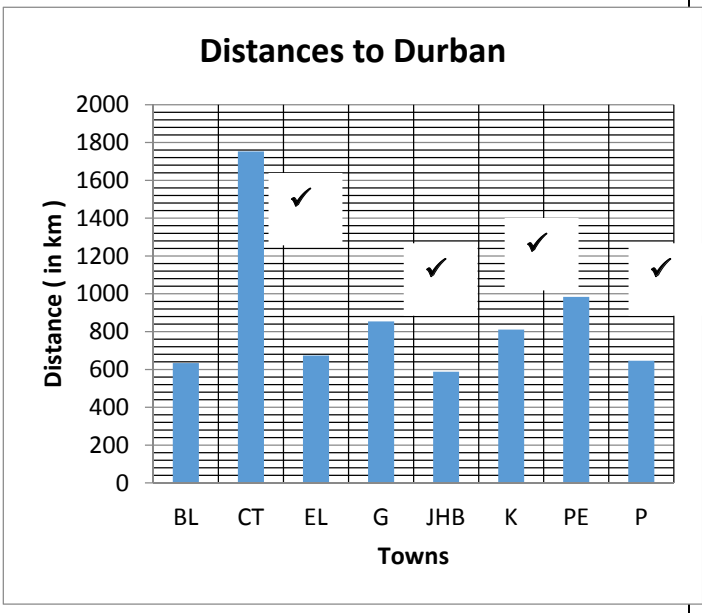
6.3.2 (b) Assignment 2 Memo

QUESTION 1 [40]			
QUES	SOLUTION	EXPLANATION	TL
1.1.1	The places where the bus will stop on the route from Durban to Pretoria✓✓	2O explanation (2)	1
1.1.2	Mondays and Wednesdays✓✓	2RT correct days (2)	1
1.1.3	Vereenigeng, ✓ Escort, ✓ Howick and ✓ Pinetown✓	4 RT correct towns (4)	1
1.1.4	06h15, OR quarter past six ✓ This is in the morning✓	1RT 1O (2)	1
1.1.5	05h55, OR Five minutes to six In the morning	1 RT 1 O (2)	1
1.1.6	21h55 – 12h30✓ = 9 hours 25 minutes✓	1M subtracting 1A time (2)	2
1.1.7	No. ✓ These times are reasonably reliable, but there is always the possibility of delays due to weather conditions, road conditions, traffic conditions and so on. ✓	1O 1J (2)	4
1.1.8	Gjd0830: 16h40 – 06h15 = 10 hours 25 minutes✓ Gdj0800: 16h30 – 07h15 = 9 hours 15 minutes✓ The duration may be affected by: • Wind direction✓ • Different engine capacities • Different driver's skills Accept any appropriate explanation	1A duration 1A duration 1O (3)	4

1.1.9	Estcourt to Pretoria: The only bus that stops in Estcourt is the Gdj1400✓ The bus travels on a Thursday or Saturday✓ Departure time from Estcourt= 16h30 and arrival time in Pretoria = 22h05✓ Total travelling time = 5 hours 35 minutes✓ Pretoria to Howick: The only bus that stops in Howick is the Gjd0830✓ This bus travels on a Monday and Wednesday Departure time from Pretoria= 06h15 and arrival time in Howick = 14h30✓ Total travelling time = 8 hours 15 minutes✓	1A identifying the bus 1A days 1A Departure and arrival time 1A total travelling time 1A identifying the bus 1A days 1A Departure and arrival time 1A total travelling time (8)	3
1.1.10	People encounter timetables all the time in daily life, from television timetables to transport timetables and study timetables. Being able to interpret timetables enables people to plan their lives and complete activities and tasks. ✓✓	1 J (2)	4
1.2.1	646 km ✓✓	2RT (2)	1
1.2.2(a)	Consumption per km = $\frac{26\ \ell}{100\ km}$ = 0.26 ℓ/km ✓ litres needed = 0,26 ℓ/km × 646km✓ = 167,96 ℓ✓	1A consumption per ℓ 1M/A multiplication 1CA fuel needed (3)	2
1.2.2(b)	Fuel cost = 167,96 ℓ × R11 / ℓ ✓ = R1 847,56✓	1M multiply by R11/ ℓ 1CA cost (2)	2

1.2.3	Speed = $\frac{Distance}{time}$ 60 km/h = $\frac{646km}{time}$ ✓ Time = $\frac{646km}{60km/h}$ ✓ = 10,77hours✓ = 10 hours 46 minutes✓	1SF 1A change subject 1CA hours 1C hours and minutes (4)	3

QUESTION 2 [12]			
QUES	SOLUTION	EXPLANATION	TL
2.1	588, 634, 646,674,811,854,984,1753✓✓	2A ascending (2)	1
2.2	Mean = $\frac{588+634+646+674+811+854+984+1753}{8}$ ✓✓ = $\frac{6944}{8}$ ✓ = 868✓	1M adding 1M dividing 1CA answer (3)	2
2.3	Median = $\frac{674+811}{2}$ ✓✓ 740.5✓	1M/A adding 1M/A dividing 1A median (3)	2

2.4		1A Every two bars (4)	2

QUESTION 3 [11]			
QUES	SOLUTION	EXPLANATION	TL
3.1	Luxury busses have seats which are categorised as standard and business which have different prices. ✓✓	2O explanation (2)	2
3.2	• Four buses leave from Pretoria to Durban at different times✓✓	2O explanation (2)	1
3.3.1	R350 + R190✓ = R540✓	1A adding 1A answer (2)	1
3.3.2	09:00 + 7hrs37 min = 16:37✓ 16:37 + 1hrs 04min = 17:41✓ He will arrive in Durban at 17:41 **Or** Nineteen minutes to six✓	1A adding 1A adding 1CA arrival time (3)	2
3.4	Buses use different routes via different towns. ✓✓	2O explanation (2)	4

6.3.3 (a) Assignment 3 **MARKS: 70**

Question 1 (36)

In 2000 Mr Smith went off on retirement. At the end of 2000 he bought himself a new car for R120 000 cash. Every year the car's value depreciated by 8% per annum. At the end of 2002 he decided to invest R55 000 at 10,5% per annum compounded yearly at **Bank A (Investment A)**. His neighbour also invested R55 000 for the same period at 12% per annum simple interest at a different bank, **Bank B (Investment B)**.

Given below is the table Mr Smith used to keep track of his car and his investment. Use the table below to answer the questions that follow.

Note: The values in this table are rounded off to the nearest rand.

At the end of …	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
Value of Vehicle	R101 568	**A**	R85 967	R79 090	R72 763	R66 942	**B**
Value of Investment A	R55 000	R60 775	R67 157	R74 208	R82 000	**C**	**D**
Value of neighbour's investment B	R55 000	**E**	**F**	R74 800	R81 400	R88 000	R94 600

1.1 Why does the value of the vehicle start at R101 568 at the end of 2002? (2)

1.2 Mr Smith says his car is depreciating in value. Explain the meaning of depreciation. (2)

1.3 Calculate the values of the vehicle at **A** and **B.** (4)

1.4 Investment B is calculated at 12 % per annum simple interest. Determine the value of **F** in the table above. (4)

1.5 At the end of 2008 Mr Smith's investment was R100 124 (**D**). Show how this value was determined. Show ALL calculations. (6)

1.6 Draw neat graphs on ANNEXURE A of the **Vehicle depreciation**, **Investment A** and **Investment B** on the same system of axes. Clearly label the graphs. (10)

1.7 Describe the impact on the neighbour's investment compared to Mr Smith's investment if Bank B's interest rate increased to 13% per annum simple interest? Justify your answer by means of calculations. (3)

1.8 At the end of 2004 Mr Smith was very sorry that he did not use Bank B. Would you have felt the same way? Why? (3)

Question 2 (34)

Build It quoted Mr Smith R20 000 to build a garage onto his house. He is looking for a cheaper option. He opts for a temporary drive-thru shelter as shown in the picture below.

The frame is made out of metal and is covered with a shade cloth (Note that the shade cloth will be attached in its length). The ground area must be a concrete floor of 10 cm thick. Refer to the table below and answer the following questions. Show ALL calculations:

Item	Cost
Metal	R109 per 6m length
Shade cloth	R512 per roll (each roll is 15 m long and 3 metres wide)
Concrete	R89/m^2

You may use the following formula: $\pi = 3{,}142$

Perimeter of a rectangle = 2(length + breadth)

Area of rectangle = length × breadth

Volume of rectangular prism = length × breadth × height

Circumference of circle = 2 × π × radius

2.1 Calculate the cost of the concrete (5)

2.2 In calculating the total metal required, Mr Smith had to be reminded that the metal is sold in 6m lengths. Refer to the sketch below to determine the following:

2.2.1 Calculate how many lengths of metal are required for:

(a) The frame of the base. (3)

(b) The uprights. (3)

(c) The stabilizers (2)

(d) The semicircles (arches) (5)

2.2.2 Calculate the total cost of the metal. (3)

2.3 Mr Smith struggles with calculations and decided to use a tape measure to measure the width of one arch starting from the base of one upright to the base of the upright on the other side. It measured 13,1 m.

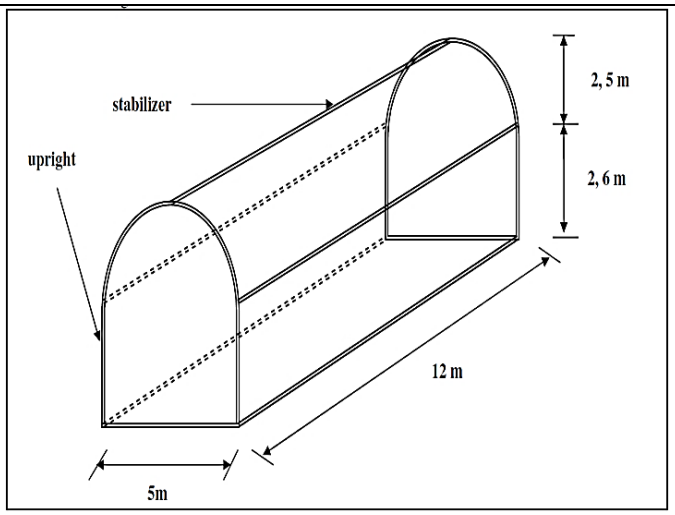
2.3.1 Convert 13,1 m to mm. (2)

2.3.2 Determine how many rolls of shade cloth are required if one roll is 3 m wide. (3)

2.3.3 Hence, determine the total cost of the shade cloth. (2)

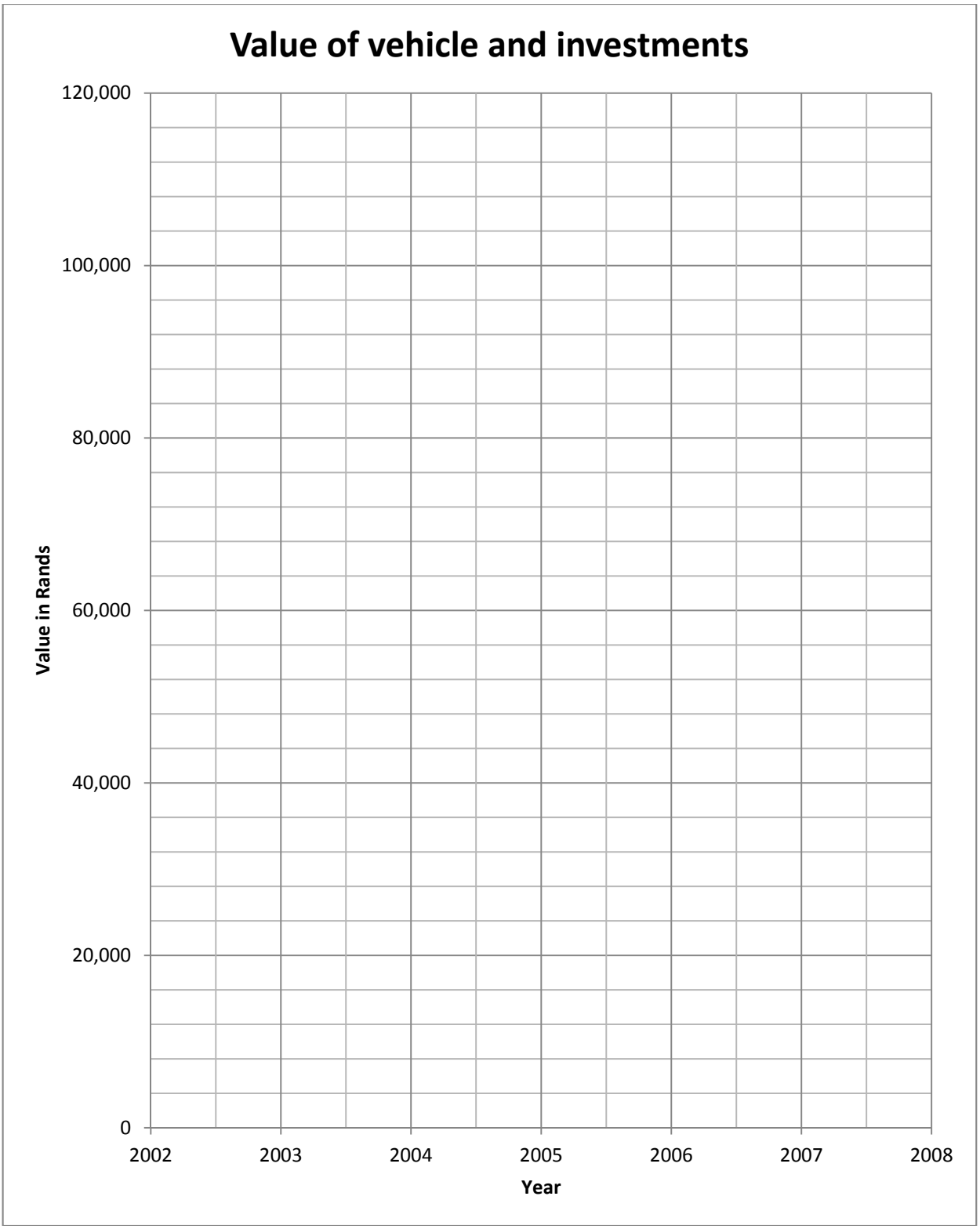
2.4 Calculate the total cost of all the material required to erect this temporary garage. (2)

2.5 Mr Smith thinks he should invest in a permanent garage but he is still unsure what to do because he likes the temporary garage. Explain two ways how you could convince Mr Smith to go for the temporary garage. (4)

Steel Frame Construction	Picture
	

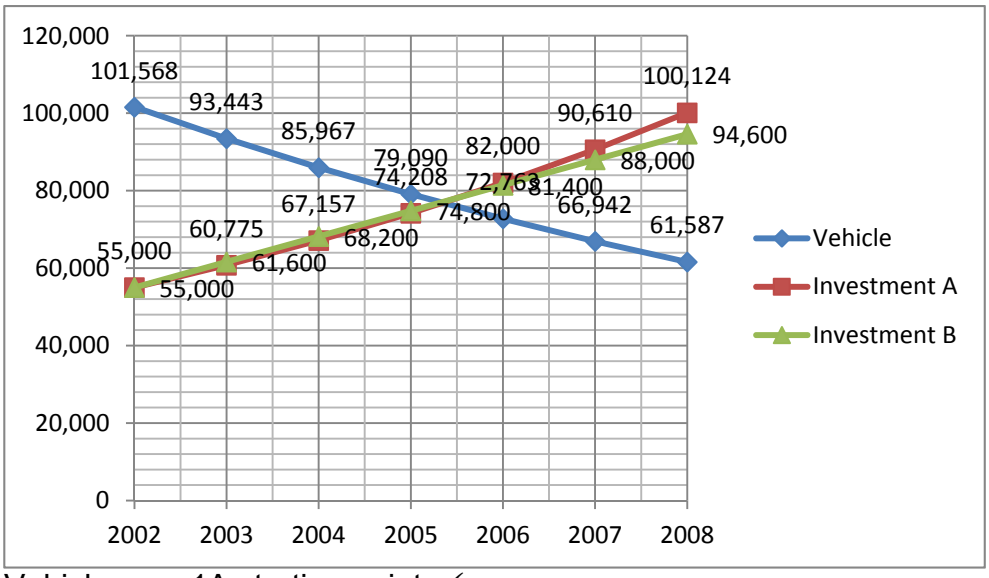
ANNEXURE A

QUESTION 1.4



6.3.3 (b) Assignment 3 Memo

Ques 1	Solution	Explanation	TL
1.1	The car depreciated since 2000 ✓✓ O	2O (2)	4
1.2	When the value of an item decreases ✓✓ O	2O (2)	1
1.3	A = R101 568 – (8% × R101 568) ✓ MA = R101 568 – R8 125,44 ≈ R93 443 ✓ CA B: R66 942 – 8% of R66 942 ✓ MA = R66 942 – R5 355.36 = R61 586.64 ≈ R61 587 ✓ CA	1MA 1CA answer 1MA 1CA answer (4)	2
1.4	E: R55 000 + (12% × R55 000) ✓ MA = R61 600 ✓ CA F: R61 600 + R6 600 ✓ MA = R68 200 ✓ CA	1MA 1CA answer 1MA 1CA answer (4)	3
1.5	C(2007) = R82 000 + 10,5% × R82 000✓MA = R82 000 + R8 610 ✓ M = R 90 610 ✓ CA D(2008) = R90 610 + 10,5% × R90 610✓MA = R90 610 + R9 514.05 ✓ M ≈ R100 124 ✓ CA	1MA 1M adding 1CA answer 1MA 1M adding 1CA answer (6)	3

1.6	 Vehicle: 1A starting point ✓ 1A end point ✓ 1A labelling the graph ✓ Investment A: 1A starting point ✓ 1A end point ✓ 1A labelling the graph ✓ Investment B: 1A starting point ✓ 1A end point ✓ 1A labelling the graph ✓ Joining the points ✓ (10)		10
1.7	13% × R55 000 = R7 150 ✓MA R7 150 × 6 = R42 900 ✓MA R55 000 + R42 900 = R97 900 ✓ CA The value of the neighbour's investment would increase ✓ O BUT will still be less than Mr Smith's final investment amount. ✓O	1MA 1MA 1CA 2O (5)	4

1.8	Yes ✓ O He would have received more money from Investment B at that time ✓✓ O	1O 2O (3)	4
2.1	Calculating cost of concrete V = 12m × 5m × 10cm ✓S = 12m × 5m × 0,1m ✓C = 6 m^3 ✓ A Cost = R89 × 6 ✓M = R534 ✓ CA	 1S Substitution 1C Conversion 1A answer 1M multiplying 1CA answer (5)	1
2.2.1 (a)	Frame: P = 2(12m + 5m) ✓ SF = 34 m ✓ A ≈ (34 ÷ 6) = 5.6 ≈ **6 lengths**	1SF 1A answer 1R rounding (3)	2
2.2.1 (b)	Uprights: 4 × 2,6 m = 10,4 m ✓MA ≈ (10,4 ÷ 6 = 1,7 ✓ A ≈ **2 lengths** ✓R	1MA 1A answer 1R rounding (3)	2
2.2.1 (c)	Stabilizers: 3 × 12m = 36 m ✓MA ≈ (36 ÷ 6) = **6 lengths** ✓A	1MA 1A answer (2)	2
2.2.1 (d)	Semi circle: (2 × 3,142 × 2,5 m) ÷ 2 ✓M = 7,9 m ✓ S ≈ (7,9 ÷ 6) = 1,3 ✓ A ≈ **2 lengths** ✓ R Total semi circles: 2 × 2lengths = **4 lengths** ✓	1MA radius = 2,5m 1S simplification 1A answer 1R rounding 1S simplification (5)	3
2.2.2	Total metal lengths = 6 + 2 + 6 + 4 = 18 Total cost of metal = 18 × R109 ✓ MA = R1 962 ✓CA	1M adding 1A multiplying with R109 1CA answer (3)	1

2.3.1	13,1 m × 100 ✓ M = 1 310 mm ✓ A	1M 1A answer (2)	1
2.3.2	Rolls = 13,1 m ÷ 3 m ✓ M = 4, 4 m ✓ A ≈ 5 rolls ✓ R	1M 1A answer 1R rounding (3)	1
2.3.3	Total cost of shade cloth = 5 × R512 ✓ M = R2 560 ✓CA	1M multiplying 1CA answer (2)	1
2.4	Total cost of material R2 560 + R1 962 + R534 ✓ M = R5 056 ✓ CA	1M adding 1CA answer (2)	1
2.5	Costs The temporary garage is much cheaper / the permanent garage will be too expensive ✓✓ O Building/erecting time Temporary garage can be erected within a shorter period / Permanent garage can take longer to build ✓✓ O	2O 2O (4)	4

6.3.4 (a) Investigation 1 **MARKS:50**

Instructions:

1. Answer all the questions.
2. Show all your calculations.
3. In question 1.5 where you should complete the tables it will be best if you do in each case at least one row of calculations on your answer sheet so that your teacher can see your thinking.
4. The tables can be completed on the Answer Sheet – you don't have to redraw them.
5. Carefully follow instructions regarding rounding.
6. Write neatly and legibly.

This question paper consists of 8 pages including the Appendix and Answer Sheet

Question 1 [20]

School ABC is in need of a new photocopying machine. The SGB of School ABC requests the Grade 12 Mathematical Literacy class to investigate various options of different suppliers to find the most suitable photocopying machine for the school. In this investigation, you are going to assist the Grade 12 learners of School ABC to investigate various pay options for photocopying machines.

In **Annexure A,** the quotations for four different companies are shown. You will need the information in these quotations to answer the questions.

Study Quotation 1 in Annexure A and answer Question 1.

1.1 What is a quotation and what is its purpose? (2)

1.2 Use the amounts just as it is given on the quotation and explain how you will determine the total monthly cost to make "n" copies (where n is the number of copies made? (2)

1.3 Explain what VAT is and also state what VAT stands for. (2)

1.4 What is meant with the statement: "All prices exclude VAT at 14%"? (1)

1.5 One of the SGB members of ABC high school states that the school will pay the same amount per month, whether you first calculate the VAT on the rent and price per copy before you get the total, as opposed to when you first add the total cost and then add the VAT. Do an investigation and verify if this statement made by the SGB member is correct or not. Complete TABLE 1 and (8)

TABLE 2, as well as the additional values at Table 2, as part of your investigation). Use the tables on the answer sheet for this. **Do not round off any of your answers, unless stated otherwise (last column of table 2).**

TABLE 1: Calculating total monthly cost and then VAT

Number of copies	Price of copies without VAT (in Rand)	Rent of copier without VAT (in rand)	Total amount for copies and rent without VAT (in Rand)	Total amount for copies and rent with VAT (in Rand)
0				
500				
1000				
1500				
2000				
2500				

TABLE 2: Calculating VAT on items and then determine total monthly cost

Price of one copy including VAT: .....

Cost to rent machine including VAT: .....

Number of Copies	Cost for copies including VAT (in Rand)	Cost for Rent of photocopier including VAT (in Rand)	Total monthly cost including VAT (in Rand)	Round the total monthly cost incl. VAT off to the nearest whole number (in Rand)
0				
500				
1000				
1500				
2000				
2500				

1.6 Round the answer of the price per copy including VAT, as well as the price for renting the photocopying machine including VAT (for quotation 1) off to two (1)

decimal places and write both values down. Rewrite your answer of 1.1 using these numbers.

1.7 Use TABLE 2 and draw a graph of total monthly cost (rounded to the nearest whole number) against number of copies made for the first quotation by CC Copiers on the grid provided on the **ANSWER SHEET**. Extend the graph to the end of the grid (for 5 000 copies) and label the graph. (4)

Question 2 [11]
Investigate Quotation 2 of Smith & Son and answer the questions that follow:

2.1 On what date will the quotation for Smith & Son expire? (2)

2.2 **Explain in words** how the total monthly cost will be calculated for rent and copies made according to the quotation of Smith & Son. (2)

2.3 The following table shows the total monthly cost for rent and copies according to the quotation of Smith & Son: (3)

No of copies	0	500	1 000	1 500	2 000	2 500	**C**	4 000
Monthly cost	400	400	**A**	525	**B**	775	900	1 150

Calculate the value of A, B and C in the table.

2.4 Sketch the graph of the monthly cost against number of copies made for **Quotation 2** on the grid on the **ANSWER SHEET**. The last point on your graph should be for 5 000 copies (4)

Question 3 [19]

Study **Quotations 3 and 4** to answer Question 3.1 and 3.2.

3.1 The graph that represents Quotation 3 is already drawn on the grid on the ANSWER SHEET. **What will be the values of D, E and F for quotation 3?** (3)

3.2 The graph that represents quotation 4 is also drawn on the grid on the ANSWER SHEET. Write a formula to represent the total monthly cost for quotation 4. (2)

Use all 4 quotations in APPENDIX A, as well as the 4 graphs on the grid on the ANSWER SHEET and answer questions 3.3 to 3.5.3:

3.3 Explain in words what happens at the point (1 400; 700) on the graph. Also, give a name for this point. (2)

3.4 It is estimated that school ABC makes 5 000 copies per month. A learner claims that quotation1 will be the cheapest option for the first year. Describe in words how you can verify this statement using the graph on the Answer Sheet. (2)

3.5 An SGB member makes the remark that it is important to note that the rent of the photocopying machine in **quotation 1** has an annual increase of 30%.

3.5.1 Explain the meaning of the word "**annually**". (1)

3.5.2 After how many years will the total annual cost for quotation 1 become more than the total annual cost for quotation 2? (5)

3.5.3 After 3 years, the contracts on both the machines of quotations 1 and 2 would expire. Would the fact that the total cost for quotation 1 becomes more than the total cost for quotation 2 imply that the SBG must rather choose quotation 2 if they want to go for the cheapest option? ***Explain your answer*** (4)

APPENDIX A

QUOTATION 1

QUOTATION

CC Copiers — Quotation no. 3592
P/Bag 2150
Bloemfontein — 03/01/2016

To: ABC school
Bloemfontein

Rent per month:	R438,60
Cost per copy:	10,5 c
Rent Increase per year	30 %

Quotation valid for 14 days

All prices exclude VAT at 14%

Question 2.4

QUOTATION 2

AJ Smith & Son Office supplies — 4841
Hill Street 12
Bloemfontein

QUOTATION

Date of Quotation: 5/01/2016
ABC School Bloemfontein
Quotation valid for 30 days

Rent per month	R400
Price per copy	25 c*
Yearly increase	0%
*The first 1000 copies at no charge per copy	
All prices include VAT at 14%	
OUR SERVICE OUR PRIDE!!!	

Question 3.4

QUOTATION 3

Speck & Co.
QUOTATION

Quotation Nr: 13/282

To: ABC School
Bloemfontein

Date: 07/01/2016
Contact person: Jason
Cell: 072 345 6789

Rent per month	**D**
Price per copy	**E**
Free copies included: **F**	
All prices include VAT at 14%	Quotation valid for 21 days from date of issue
Thank you for your business	

QUOTATION 4

QUOTATION
COPYING SOLUTIONS

Quotation no: 2325/7

Sim Street 15
Bloemfontein

Customer: Governing body, ABC School, Bloemfontein
Date of quotation: 5/01/2016

All quotations valid for 14 days

Contract: No renting cost, R0,50 per photocopy

The best deals in town!

ANSWER SHEET

NAME: …….. Gr. 12 ……..

Use the following tables to answer question 1.5. Also, write answers on the dotted lines.

TABLE 1: Calculating total monthly cost and then VAT

Number of copies	Price of copies without VAT (in Rand)	Rent of copier without VAT (in rand)	Total amount for copies and rent without VAT (in Rand)	Total amount for copies and rent with VAT (in Rand)
0				
500				
1000				
1500				
2000				
2500				

TABLE 2: Calculating VAT on items and then determine total monthly cost

Price of one copy including VAT: .....

Cost to rent machine including VAT: .....

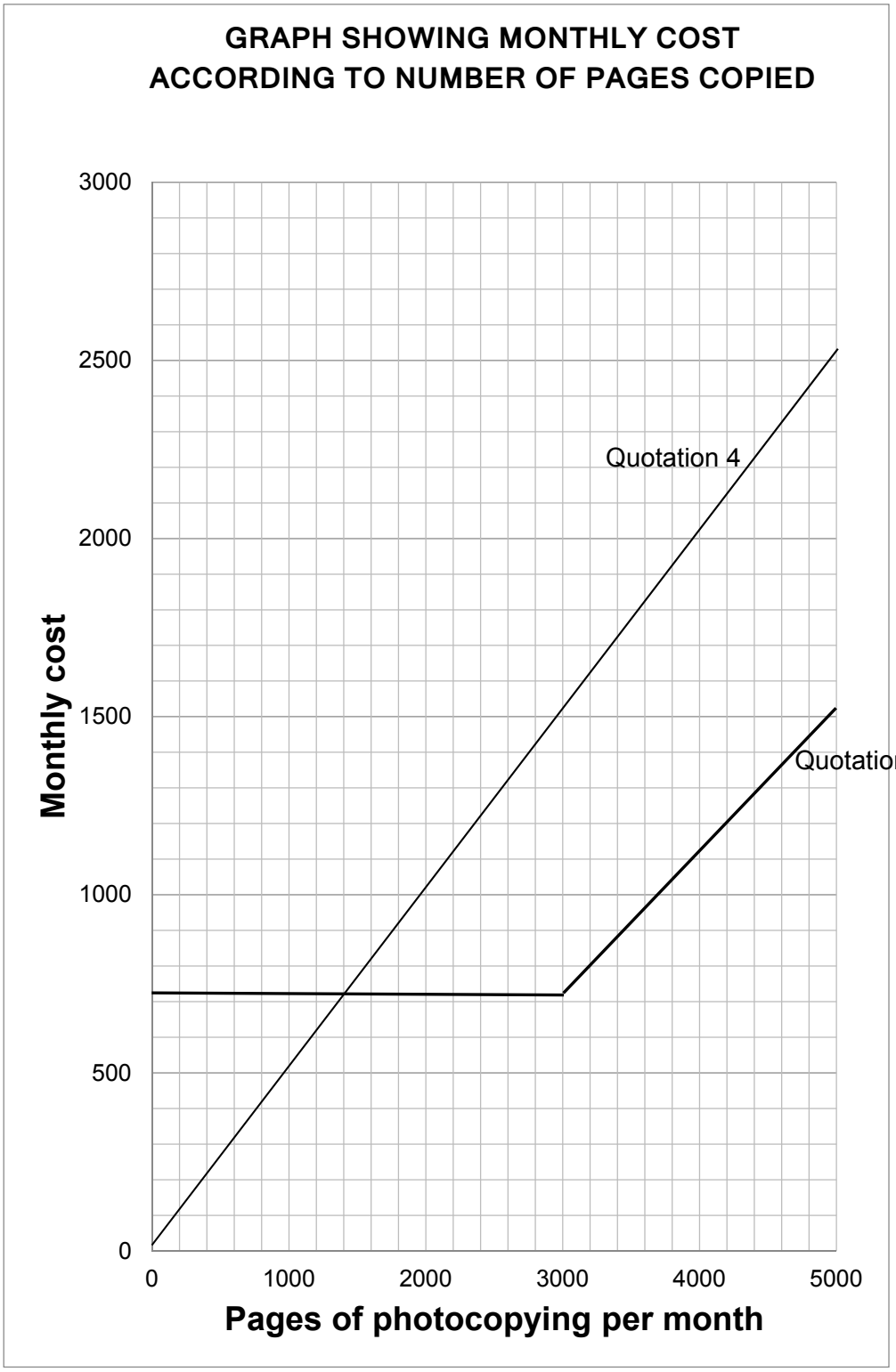
Number of Copies	Cost for copies + VAT (in Rand)	Cost for Rent of photocopier + VAT (in Rand)	Total monthly cost including VAT (in Rand)	Round the total monthly cost incl. VAT off to the nearest whole number (in Rand)
0				
500				
1000				
1500				
2000				
2500				

Conclusion: ……..

……

NAME: …….. Gr. 12 ……..

Use the following grid to answer questions 1.7 and 2.4



6.3.4 (b) Investigation 1 Memo

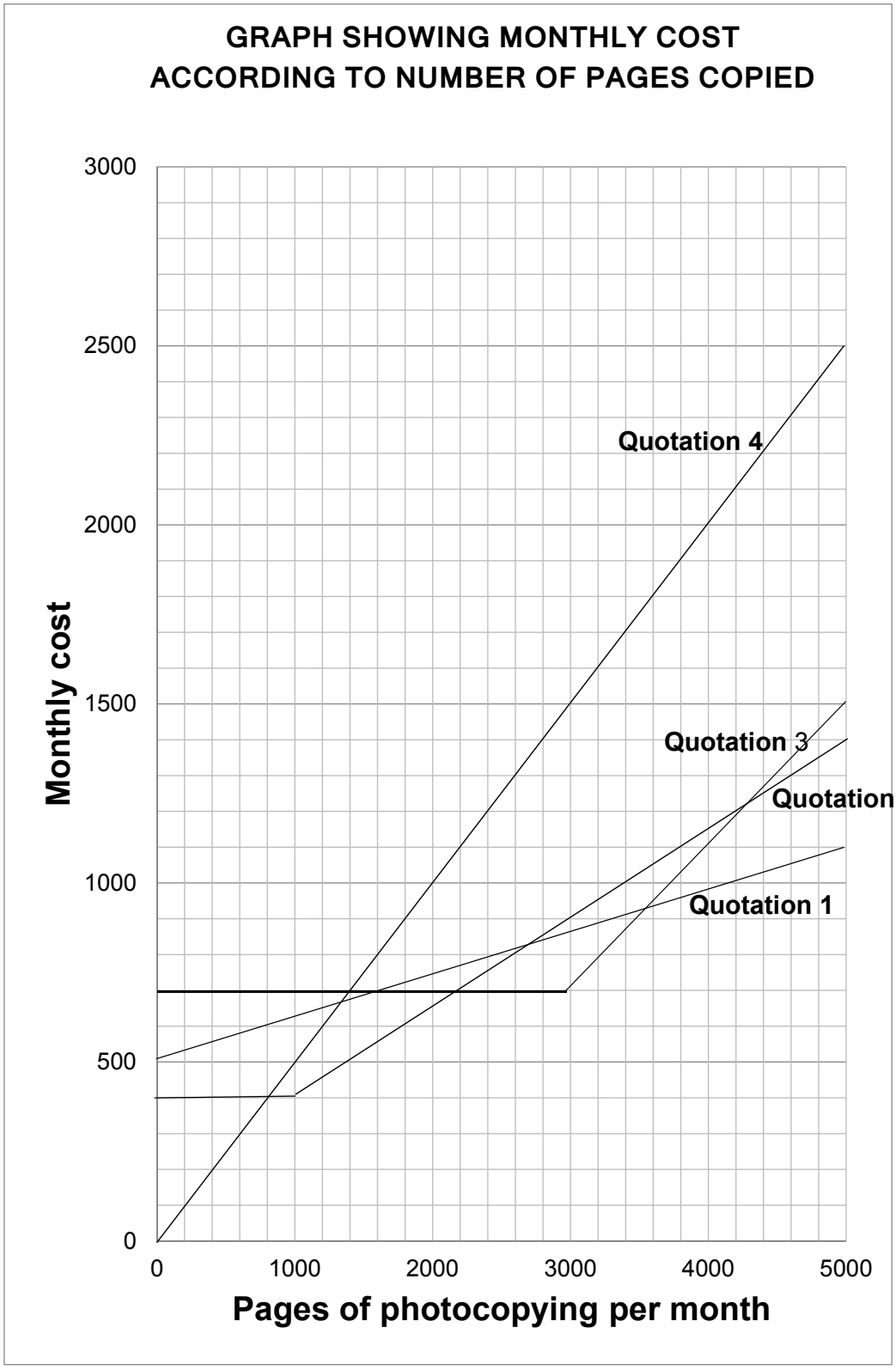
<table>
<tr><td></td><td>Question 1 [20]</td><td></td></tr>
<tr><td>1.1</td><td>A quotation is a formal statement setting out the estimated cost for a particular job or service✓. A quotation is given when people want to know how much an item will cost before buying it.✓</td><td>1 E
1 E (2)</td></tr>
<tr><td>1.2</td><td>Total monthly cost = 438,60 ✓+ 0,105 ✓ x n where n is the number of copies made
Or:
The total monthly cost is R438, 60 ✓plus R0, 105 times the number of copies made.✓</td><td>1 RD
1 RD + convert to Rand (2)</td></tr>
<tr><td>1.3</td><td>VAT – stands for Value Added Tax ✓
It is the tax payable on goods bought and services delivered ✓</td><td>1 E
1 E (2)</td></tr>
<tr><td>1.4</td><td>That VAT at 14% must still be calculated and added to all quoted prices.✓</td><td>1 E (2)</td></tr>
<tr><td>1.5</td><td>
TABLE 1: Calculating total monthly cost and then VAT
<table>
<tr><th>Number of copies</th><th>Price of copies without VAT (in Rand)</th><th>Rent of copier without VAT (in rand)</th><th>Total amount for copies and rent without VAT (in Rand)</th><th>Total amount for copies and rent with VAT (in Rand)</th></tr>
<tr><td>0</td><td>0</td><td>438,60</td><td>438,60</td><td>500,004</td></tr>
<tr><td>500</td><td>52,50</td><td>438,60</td><td>491,10</td><td>559,854</td></tr>
<tr><td>1000</td><td>105</td><td>438,60</td><td>543,60</td><td>619,704</td></tr>
<tr><td>1500</td><td>157,50</td><td>438,60</td><td>596,10</td><td>679,554</td></tr>
<tr><td>2000</td><td>210</td><td>438,60</td><td>648,60</td><td>739,404</td></tr>
<tr><td>2500</td><td>262,50</td><td>438,60</td><td>701,10</td><td>799,254</td></tr>
<tr><td></td><td></td><td></td><td>✓</td><td>✓</td></tr>
</table>
TABLE 2: Calculating VAT on items and then determine total monthly cost
Price of one copy plus VAT: R0,1197 ✓
Cost to rent machine plus VAT: R500,004 ✓
<table>
<tr><th>Number of Copies</th><th>Cost for copies + VAT (in Rand)</th><th>Cost for Rent of photocopier + VAT (in Rand)</th><th>Total monthly cost including VAT (in Rand)</th><th>Round the total monthly cost incl. VAT off to the nearest whole number (in Rand)</th></tr>
<tr><td>0</td><td>0</td><td>500,004</td><td>500,004</td><td>500</td></tr>
</table>
</td><td>1 All values in column 4 (total cost amounts without VAT) correct
1 All values in column 5 (total cost amounts with VAT) correct
1 A
1 A
1 All values in column 2 correct
1 All values in column 4 correct
1 R (column 5)
Penalise only once in the question if answers were rounded, except in</td></tr>
</table>

	Conclusion: The SGB member is correct ✓	1 C (8)
1.6	Monthly cost = 500 + 0,12 x ✓	1 R (1)
1.7	***See Graph*** 1 Starting at (0;500) 1 Last point (5 000;1 100) 1 Any two other points correct 1 Label	(4)
Question 2 [11]		
2.1	4/02/16 or 4 February 2016✓✓	2 C (2)
2.2	The monthly rent will be R400 which includes 1 000 free copies ✓. So you will pay R400 for all copies up to 1 000 copies. Thereafter you will pay R0,25 (or 25 c) per copy ✓.	1 E 1 E (2)
2.3	**A** = R400 ✓ **B**: 2 000 – 1 000 = 1 000 copies Monthly cost: R400 + 1 000 x R0,25 = R650 ✓ **C**: 900 – 400 = R500 (cost of copies)✓ R500 ÷ R0,25 = 2 000 copies 2 000 copies + 1 000 copies = 3 000 copies C = 3 000 ✓	1 A/RD 1 A 1 A (3)
2.4	***See graph*** 1 Starting point (0;400) 1 Shape of graph up to 1 000 copies) 1 Correct last point namely (5 000;1 400) 1 Shape of graph from (1 000;400) to last point	(4)
	Question 3[19]	
3.1	**D**: R700 ✓ **E**: Two points: (3000;700) and (5000;1500) the copies rise with 2000 and Cost with R800, thus: $\frac{800}{2000}$ = 40c or R0,40 ✓ **F**: 3 000 ✓	1 RD 1 A 1 RD (3)
3.2	Monthly cost = 0,5 x ✓ where x is the number of copies made ✓	1 C 1 Variable explained (2)
3.3	The monthly cost and the number of copies are the same for quotations 3 and 4. ✓ Break-even-point ✓	1 E 1 Term (2)

500	59,85	500,004	559,854	560
1000	119,70	500,004	619,704	620
1500	179,55	500,004	679,554	680
2000	239,40	500,004	739,404	739
2500	299,25	500,004	799,254	799
	✓		✓	✓

the last column of table 2 – here you penalise 1 mark again if incorrectly rounded.

3.4	Go to 5 000 copies. Move up, the first graph that you touch will be the cheapest option✓. In this case, it is quotation 1. The learner is correct.✓ (Any other reasonable answer)	1 E 1 RD/CA from 1.6 (2)
3.5		
3.5.1	Annually means every year **OR** on a yearly basis **OR** per year✓.	1 E (1)
3.5.2	Contract 2: For 5 000 copies the monthly cost will be: 400 + (5 000 – 1 000) x 0,25 = R1 400 Annual cost: 1 400 x 12 = R16 800 ✓ **Contract 1:** **Year 1:** 500 + (0,12 x 5 000) = R1 100 Annual cost: R 1 100 x 12 = R13 200 ✓ (take note: learners can also read the value from the graph) **Year 2**: Rent: 500 x 1,3 = R650 650 + (0,12 x 5 000) = R1 250 Annual cost: R1 250 x 12 = R15 000 ✓ **Year 3**: Rent: 650 x 1,3 = R845 845 + (0,12 x 5 000) = R1 445 Annual cost: R1 445 x 12 = R17 340 ✓ After 2 years you will pay more for contract 1 than contract 2 ✓	1 A Contract 2 annual cost 1 A Contract 1: year 1 1 CA total year 2 1 CA total year 3 1 D (c/a) (5)
3.5.3	Over 3 years contract 2 will cost 3 x R16 800 = R50 400 ✓ Contract 1 will cost over 3 years: R13 200 + R15 000 + R17 350 ✓ = R45 550 ✓ No, contract 1 will still be cheaper over 3 years than contract 2 ✓.	1 Total Contract 2 1 CA Adding 1 CA 1 D (c/a) (4)


GRAPH SHOWING MONTHLY COST
ACCORDING TO NUMBER OF PAGES COPIED
Monthly cost
3000
2500
2000
1500
1000
500
0
0
1000
2000
3000
4000
5000
Pages of photocopying per month
Quotation 4
Quotation 3
Quotation 2
Quotation 1

6.3.5 (a) Investigation 2

Marks: 50

Calculating the number and cost of paving blocks

For this investigation you will:

- Calculate the area to be paved
- Find out the dimensions of two different possible sizes of square paving blocks for this job
- Find out about the cost of the two different sizes of paving blocks
- Estimate the number of paving blocks needed, using the two different sizes of paving blocks
- Calculate the costs of the paving blocks needed for each of the sizes
- Compare the cost of the job, using the two different paving block sizes.

SECTION 1: Introductory information for the investigation:

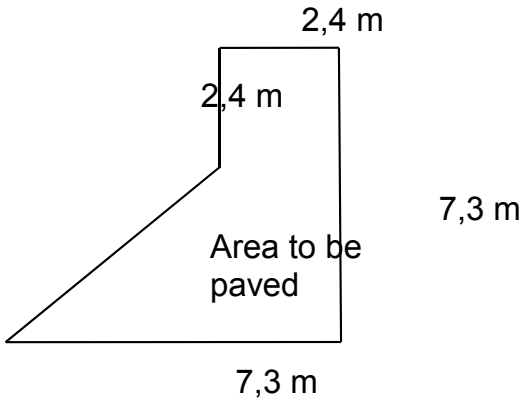
Paved area in gardens is useful for play areas and for outdoor seating. For the garden in the diagram below, the paved area will be paved with square cement paving blocks laid so that there is a narrow gap all around each block. This is so that grass or other spreading plants can be grown between the paving blocks. The width of the gap will be 30% of the width of the paving block. Paving blocks are made in different sizes, which have different prices, so using one size rather than another could be more economical.

1.1 Visit your nearest building supply store or garden centre to find out what sizes of square plain cement paving blocks are available and what they cost.

(4)

1.2 Choose two sizes of paving block that you will work with for this assignment. They should both have side lengths of more than 30 cm. (If it is absolutely impossible for you to find this information, then use the following sizes: 45 cm square (R28.50) and 60 cm square (R41.00).

SECTION 2: Calculations:



2.1 Use the diagram above to calculate the total area to be paved. (8)

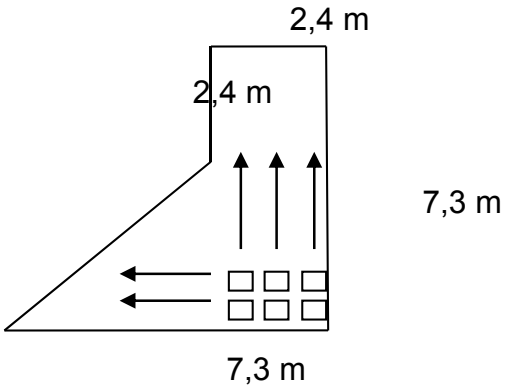
2.2 Use this area value to estimate the number of paving blocks of each size that you will need for the job (remembering that there will be a gap that is 30% of the width of the paving block all around each block). (8)

2.3.1 For each size of block, work out how many blocks you will need if you lay them in the way shown in the diagram below. At the edges, you may need to cut blocks. If the width of the block needed at an edge is less than 10 cm, then you leave it out. Any block that is cut will count as a whole block, because we can

assume that cut-off pieces will be wasted. (10)

2.3.2 You must draw scale diagrams of the paving to help you work out how many blocks you will need altogether (two drawings altogether). Decide on an appropriate scale.

Indicate your conversions of your measurements. Draw neat sketches of your design. (14)



2.4 For each of the block sizes, calculate the total cost of the paving blocks needed. (4)

2.5 Which size of paving block is more economical for this job? (2)

Total: 50

6.3.5 (b) Investigation 2 Memo

Sect A	Solution	Explanation	TL
1.1	Learners use examples given: 45 cm = 0,45m ✓ C Price = R28,50 ✓ A 60 cm = 0,60 m ✓ C Price = R41,00 ✓ A	 1C conversion 1A 1C conversion 1A (4)	1
Sect B			
2.1	 Area of rectangle = length × breadth ✓F = 7,3 × 2,4 ✓SF = 17,52 m^2 ✓ A ✓ Unit Area of triangle = ½ × base × height ✓ F = (0,5)(4,9)(4,9) ✓ SF = 12 m^2 ✓ CA Total Area = 17,52 m^2 + 12 m^2 = 29,52 m^2 ✓ CA	1A for using correct unit for area 1F correct formula 1S substitute into correct 1A answer 1F correct formula 1SF substitute into correct 1CA answer 1CA answer (8)	2
2.2	<u>Small block</u>: 30% × 0,45 m ✓M = 0,14 m ✓A Area = 0,73 × 0,73 ✓ M = 0,53 m^2 ✓ CA <u>Big block</u>: 30% × 0,6 m ✓ M = 0,18 m ✓ A Area = 0,96 × 0,96 ✓ M = 0,92 m^2 ✓CA	 1M concept of % 1A answer 1M 1A answer 1M concept of % 1A answer 1M 1A answer (8)	1
2.3.1	<u>Small block:</u> Area of rectangle = 17,52 ÷ 0,53 ✓ M ≈ 33 paving blocks ✓ CA Area of triangle = 12 ÷ 0,53 ✓M ≈ 23 paving blocks ✓ CA Total small paving blocks = 56 ✓ CA <u>Big block:</u> Area of rectangle = 17,52 ÷ 0,92 ✓ M	 1M 1A rounded answer 1M 1A rounded answer 1CA total 1M 1A rounded answer 1M 1A rounded answer 1CA total (10)	3

	≈ 19 paving blocks ✓ CA Area of triangle = 12 ÷ 0,92 ✓ M ≈ 13 paving blocks ✓ CA Total small paving blocks = 32 ✓ CA		
2.3.2	Drawings: Refer to the Rubric	2 × 7 (14)	4
2.4	Small block: 56 × R28,50 ✓ M = R1 596 ✓ CA Big block: 32 × R41,00 ✓ M = R1 312 ✓ CA	 1M 1CA 1M 1CA (4)	2
2.5	The 60 cm block (big block) is cheaper to use for paving. ✓✓ O	 2Conclusion (2)	4

RUBRIC – QUESTION 2.3.2
Small cement block

	4	3	2	1
Scale drawings	Shows a thorough understanding and knowledge of the use of a scale; Measurements are converted correctly; Understands that outside borderlines are more important than detail.	Shows a thorough understanding and knowledge of the use of a scale; Measurements are converted correctly; Draws the outside border lines but tries to include unnecessary detail.	Shows a thorough understanding and knowledge of the use of a scale; Needs help with conversion of measurements; Spends too much time on including unnecessary detail.	Shows very little understanding and knowledge on the use of a scale; Does not know how to convert measurements; Copies sketches without changing the scale
Design		Thorough analysis of the problem with well thought through solutions is evident.	Analysis of the problem is clear and explanations for the solutions can be given	Analyses the problem to a certain extent, but struggles to get a solution which works.

Big cement block

	4	3	2	1
Scale drawings	Shows a thorough understanding and knowledge of the use of a scale;	Shows a thorough understanding and knowledge of the use of a scale;	Shows a thorough understanding and knowledge of the use of a scale;	Shows very little understanding and knowledge on the use of a scale;

	Measurements are converted correctly; Understands that outside borderlines are more important than detail.	Measurements are converted correctly; Draws the outside border lines but tries to include unnecessary detail.	Needs help with conversion of measurements; Spends too much time on including unnecessary detail.	Does not know how to convert measurements; Copies sketches without changing the scale
Design		Thorough analysis of the problem with well thought through solutions is evident.	Analysis of the problem is clear and explanations for the solutions can be given	Analyses the problem to a certain extent, but struggles to get a solution which works.

6.3.6 (a) Investigation 3 **MARKS:50**

George, a business man, lives in Gauteng. In one month he must travel to Cape Town to visit his three business sites. The first site is in Cape Town which is 9 kilometres from the airport, the second site is in Paarl and is 60 kilometres from the airport and the third site is in Bellville and is 30 kilometres from the airport. George visits one site per day, travels back to Gauteng and comes back the following day to visit another site.

In this **Investigation you will be required to advise George as to which of the three rental companies offer the cheapest rate** for each of the three days he will require a car to visit the sites.

George collected the following information from advertisements of three car hiring companies at Cape Town International Airport.

		
Eezy Bucs Cars	**S'bu Taxi service**	**Joe radio Taxi service**
Only R10 per kilometre	Convenient travelling for only R100 ***basic*** fee plus R5 per kilometre	The cheapest rate per kilometre only R200 ***basic*** fee plus R2 per kilometre
Power steering, radio and air corn. Car fully serviced	Power steering and radio. Car fully serviced	Leather seats, power steering air con, ABS brakes and CD player. Car fully serviced

Answer the following questions.

1. What does the term ***basic*** mean as used in the advertisement? (2)
2. Which car rental company offers the cheapest rate per kilometre? (2)
3. The formula used to calculate the cost of hiring a car from Eezy Bucs Cars is

   Cost (in rands) = R10 x n, (where n is the number of kilometres travelled)

   (a) Write down formulae for calculating the cost of hiring from the other two companies. (4)

   (b) How much will George pay for the return trip to Paarl if he hires from Eezy Bucs Cars? (2)

   (c) The car that George used to Paarl has the fuel consumption rate of 5,2 litres per 100 km

   The cost of petrol on the day was R11,90 per litre

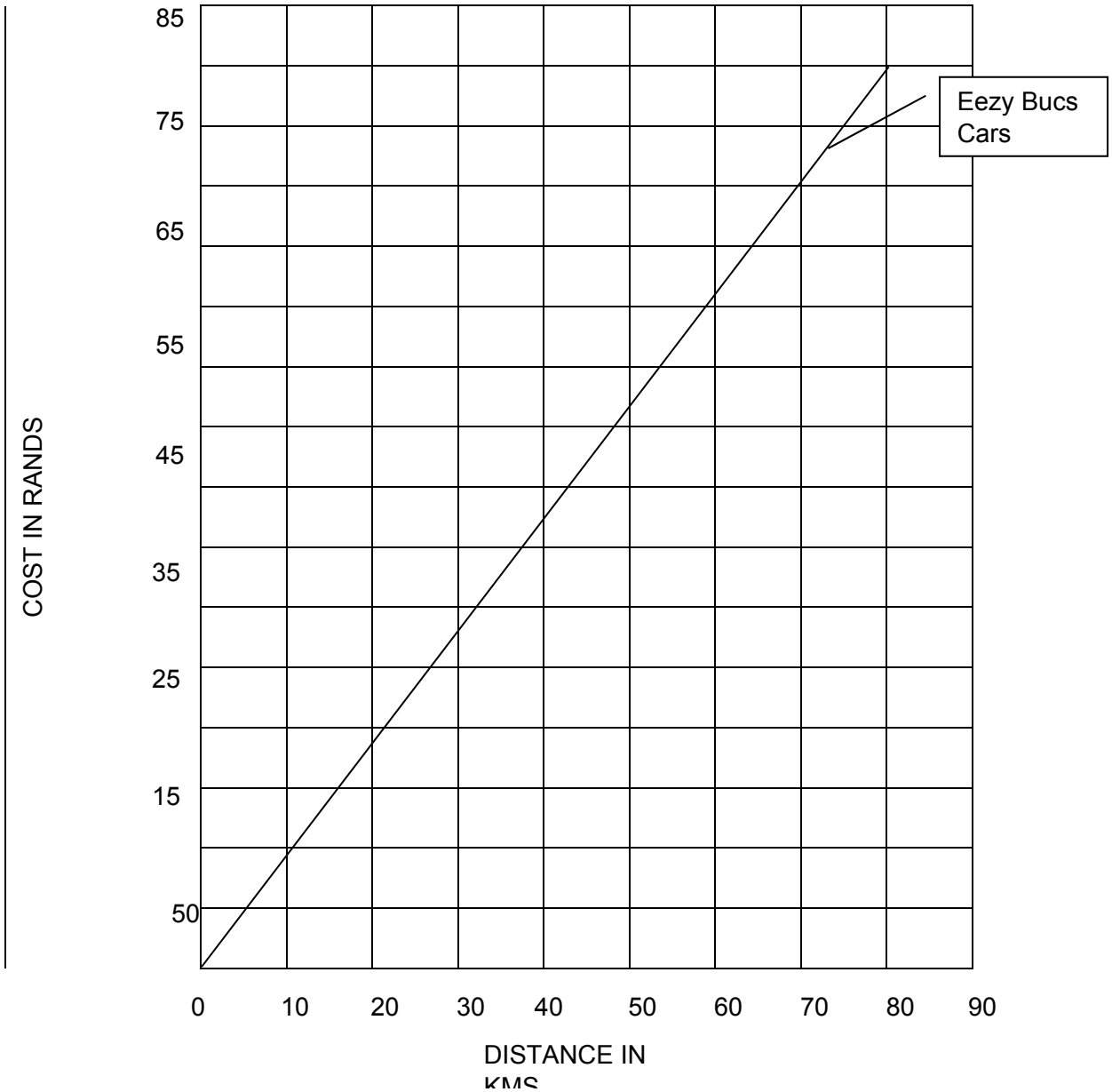
   i) Calculate the cost of petrol for the trip to Paarl (4)

ii) Determine the profit Eezy Bucs Cars made from that trip (excluding wear and tear cost). Profit = Income – Cost (2)

(d) The table below compares the hiring cost for the three companies; complete the table in your answer book. (6)

Distance (in Km)	**0**	**10**	**20**	**30**	**40**	**50**	**60**	**70**	**80**
Eezy Bucs Cars (cost in rands)	0	100	200	300	400	500	600	700	800
S'bu Taxi service (cost in rands)	100				300				
Joe Radio Taxi service (cost in rands)	200					300			

4. The graph below shows the cost of hiring from Eezy Bucs Cars for different kilometres.
   (a) On the same set of axes draw graphs that represent hiring costs from S'bu Taxi service and Joe Radio Taxi service. Clearly label your graphs. (9)
   (b) On a certain day George hired a car from S'bu Taxi services and paid an amount of R450. Use your graph to estimate the distance that George travelled on that day. (2)
   (c) If on the first day George decides to visit his uncle who lives 20 km from the airport before going for the site visit in Cape Town in the same direction, which of the three companies will be the cheapest option, and why? (4)
5. Name three other considerations that George must take into account before choosing a car hire? (3)
6. Explain in your own words what is happening at 20 km and at 35 km in terms of the cost? And which option is expensive on the respective kilometres. (4)
7. Give a reason why the graphs for S'bu Taxi services and Joe Radio service do not start at
   (0 ;0), the origin. (2)
8. Use your completed table or graph to advise George on the cheapest car hiring option for each of his site visits. (3)


COST IN RANDS
85
75
65
55
45
35
25
15
50
0
10
20
30
40
50
60
70
80
90
DISTANCE IN
KMS
Eezy Bucs
Cars

6.3.6 (b) Investigation 3 Memo

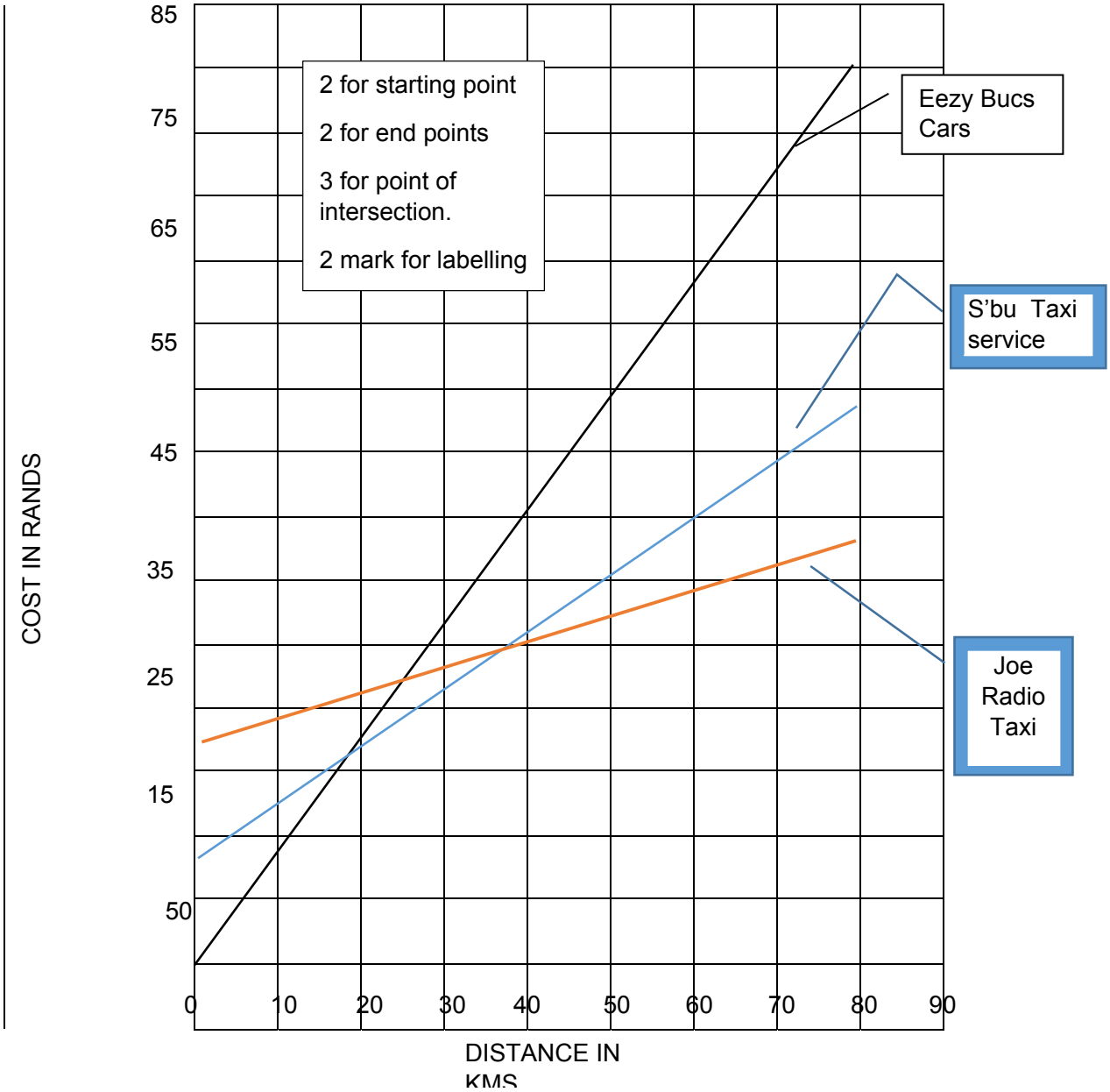
Questions	Solution	Marks	Explanation	TL
1.	Basic is the amount irrespective of the number of kilometres travelled✓✓	2		TL 1
2.	Joe radio Taxi service ✓	2		TL 1
3. (a)	S'bu: Cost(rands) = R100 + R5 x number of kms✓✓ Joe: Cost(rands) = R200 + R2 x number of kms✓✓	4		TL 2
(b)	Eezy Bucs cost (rands) = R10 x number of kms = R10 x 60 ✓x 2✓ = R1200 ✓	3	1 for return dist 1 for substitution 1 for answer	TL 3
(c)	(i) Amount of petrol = $\frac{5{,}2\ l}{100km}$ x 120km ✓ Amount of petrol = 620 litres ✓ Cost of petrol = 620 litres x R11.90 /litre✓ Cost of petrol = R74,25 ✓	4	I for multiplying by 120 1 for amnt petrol 1 for cost	TL 3
	(ii) Profit = Income – Cost = R1200 – R 74, 00 ✓ = R 1125,74 ✓	2	1 for substitution 1 for answer	TL 2
(d)				

Distance (in Km)	0	10	20	30	40	50	60	70	80
Eezy Bucs Cars (cost in rands)	0	100	200	300	400	500	600	700	800
S'bu Taxi service (cost in rands)	100	150	200	250	300	350	400	450	500
Joe Radio Taxi service (cost in rands)	200	220	240	260	280	300	320	340	360

3 mark for each correct row all numbers must be correct.✓✓ ✓

✓✓✓ TL 2

4 (b)	**See the graph**	**8**		**TL 2**
(b)	70 kms √√	2	RG	TL 2
(c)	Joe Taxi Radio service will be the cheapest ✓✓	2	RG	TL 2
5.	• Enough money • Comfort ability of the car • Safety of the car • Beauty of the car ✓✓✓ • If the cars are available • Distance to travel • Brand of the car (name of the manufacturer)	3	Any two valid considerations	TL 4
6	• At 20 kms Eezy Bucs cars and S'bu taxi service are charging the same amount ✓, and Joe Radio taxis is the expensive option ✓ • At 35 kms S'bu Taxi Service and Joe Radio taxis are charging the same amount✓ and Eezy Bucs is the expensive option✓	4		TL 4
7	• Because if you choose one of them then you have to pay the basic amount on top of the kilometres rate ✓✓	2		TL 4
8	• For the Cape Town trip the cheapest option is Eezy Bucs Cars ✓ • For the Paarl trip Joe Radio Taxis is the cheapest ✓ • For the Bellville trip S'bu taxi service will be the cheapest ✓	3	No other answer is acceptable	TL 4


COST IN RANDS
85
75
65
55
45
35
25
15
50
0
10
20
30
40
50
60
70
80
90
DISTANCE IN KMS
2 for starting point
2 for end points
3 for point of intersection.
2 mark for labelling
Eezy Bucs Cars
S'bu Taxi service
Joe Radio Taxi

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