HILLCREST HIGH SCHOOL

TRIAL EXAMINATIONS 2013

GRADE 12

MATHEMATICAL LITERACY PAPER 2

TIME: 3 HOURS

MARKS : 150

Instructions and Information

1. This question paper consists of **SIX** questions and **FIFTEEN** pages
2. Answer **ALL** the questions.
3. **QUESTIONS** 3.3.4, 4.1.4 and 5.3.2 must be answered on **ANNEXURES A, B** and **C** which are attached.
4. Number the answers correctly according to the numbering system used in this question paper.
5. An approved calculator (non-programmable and non-graphical) may be used, unless stated otherwise.
6. **ALL** working details must be shown clearly, even when a calculator is used.
7. All the final answers must be rounded off to **TWO** decimal places, unless stated otherwise.
8. Show all units where necessary.
9. Start **EACH** question on a **NEW** page.
10. All maps and diagrams are not necessarily drawn to scale unless stated otherwise.
11. Write neatly and legibly.

QUESTION 1

1.1 Jean is a teacher working for the government. She received a gross monthly salary of R 16 821,75 for June 2012. The table below shows her earnings and some of her deductions for the month of June 2012.

Table showing Jean' earnings and some of her deductions for June 2012

Pay date / Betaaldatum			Notch / Kerf		
20120630			B		
EARNINGS / VERDIENSTE			**DEDUCTIONS / AFTREKKINGS**		
Item	Description	Amount	Item	Description	Amount
0001	BASIC SALARY	**A**	0001	Pay-as-you-earn (PAYE)	2 091,86
0547	HOUSING RENTAL	800,00	0002	Pension (7,5% of monthly salary)	1 201,63
			0005	Medical Aid contribution	546,00
	GROSS SALARY	**16 821,75**		Total Deductions	**C**
				NET PAY DUE	**D**

1.1.1 Calculate the missing value **A**, Jean's **basic salary** per month? (2)

1.1.2 If **B** represents the annual basic salary, calculate the missing value **B**. (2)

1.1.3 Calculate the missing value D, her **net salary** for June 2012. (2)

1.2 The table below is used by SARS (The South African Revenue Services) to calculate the tax payable by individuals and trusts for the tax year ending 28 February 2013. Use the table to answer the questions that follow.

TAX RATES APPLICABLE TO INDIVIDIDUALS & TRUSTS (TAX YEAR 2012 / 2013)

Taxable Income (R)	Tax Rates
0 - 160 000	18% of each R 1
160 001 - 250 000	28 800 + 25% of the amount above 160 000
250 001 - 346 000	51 300 + 30% of the amount above 250 000
346 001 - 484 000	80 100 + 35% of the amount above 346 000
484 001 - 617 000	128 400 + 38% of the amount above 484 000
617 001 +	178 940 + 40% of the amount above 617 000

Tax Rebates

- Primary Rebates ..... R 11 440
- Secondary (Persons 65 and older) ..... R 6 390
- Tertiary (Persons 75 and older) ..... R 2 130

Tax Thresholds

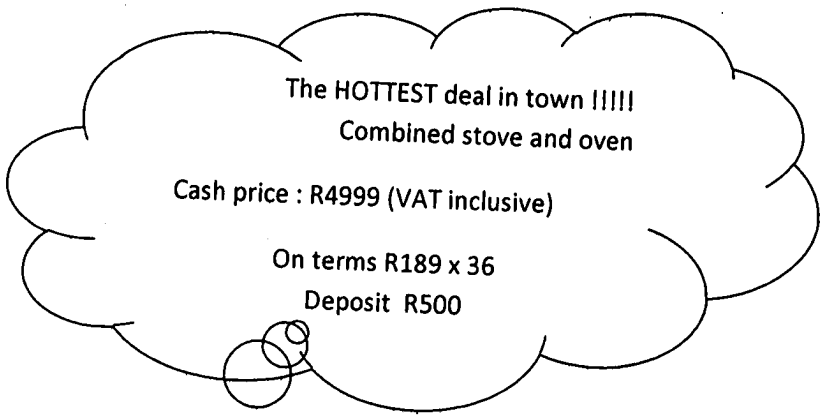
- Persons under 65 ..... R 63 556
- Persons of 65 – 74 years ..... R 99 056
- Age 75 and older ..... R 110 889

Source: www.vippayroll.co.za Tax Year 2012/2013

1.2.1 Jean (43 years old) earned an annual taxable income of R 201 861,00 for the tax year ending 2013. Use the tax table above to calculate her monthly tax payable. (7)

1.2.2 Was the correct amount of PAYE tax deducted from Jean's June 2012 salary? Justify your answer. (2)

1.3 Jean needs a new stove. After comparing a number of options, she considers purchasing the stove and oven combination as advertised below.



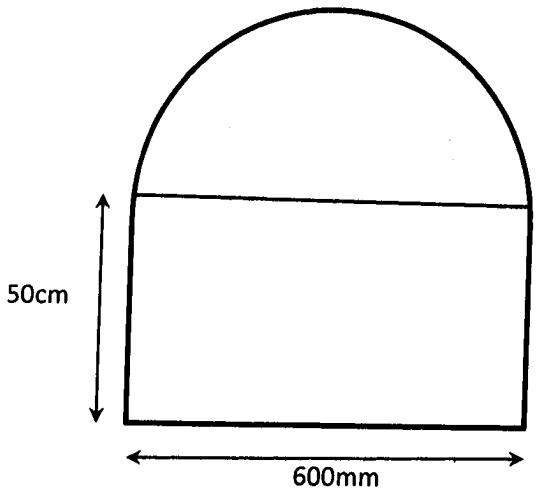
1.3.1 Calculate the value of the stove before VAT was included. (3)

1.3.2 Calculate the total cost of the stove if Jean buys it on terms? (3)

1.3.3 Kitchen appliances depreciate (reduces) by 20% per year. Jean estimates that the stove which presently costs R4 999 will be worth R1 600 after 5 years. Using the formula below, verify whether or not Jean's estimate is correct. (5)

$$A = P(1-i)^n$$

1.4 The stove and oven combination has the following shape: a semi-circle attached to a rectangle as shown in the sketch below:



Length of rectangle = 600 mm

Breadth of rectangle = 50 cm

Help Jean calculate the total area that will be required for the stove combination. (5)
The following formula may be used:

Area of rectangle = L × B

Area of Circle $= \pi r^2$, using $\pi = 3{,}14$

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QUESTION 2

Ms Olivier has decided to build a flat for her mother on the property she has just bought. The flat will consist of a bedroom, bathroom, lounge, kitchen and veranda. She has drawn a sketch for the builder. The following dimensions are required for each room.

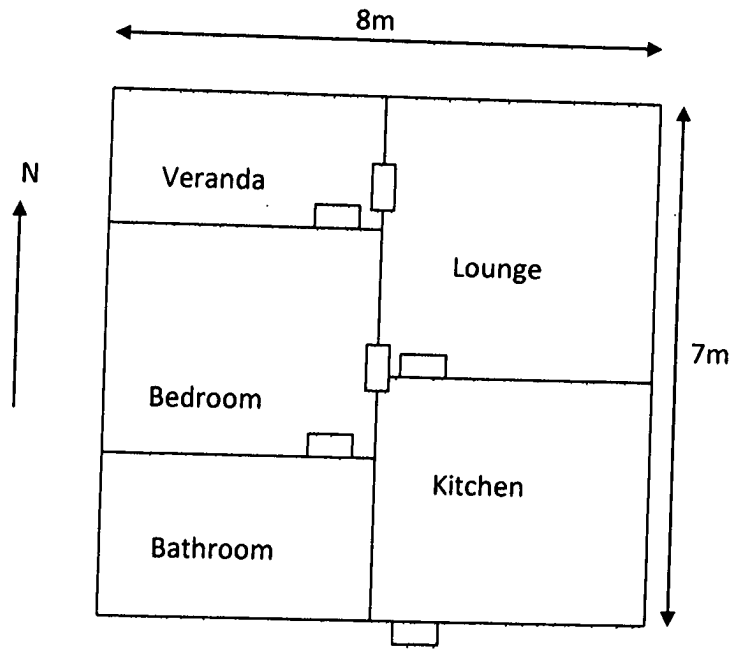
Bedroom : 3m x 4m

Lounge : 4m x 4m

Bathroom : 2,5m x 4m

Kitchen : 3m x 4 m

☐ = door



2.1 Calculate the dimensions of the veranda? (3)

2.2 The veranda, kitchen and bathroom are to be tiled.

2.2.1 Calculate the total area to be tiled? (4)

2.2.2 Tiles are sold in boxes that cover 1,4m². Each box costs R169,95. An extra 2m² must be added for breakages and cutting. Ms Olivier budgets R3800 for the purchase of the tiles. Show, with calculations, whether or not her budgeted amount is correct. (6)

2.3 Carpeting is going to be used for the lounge and bedroom. Under carpet costs R 45,99 per m² and the chosen carpets cost R 209,00 per m². Calculate the total cost for carpeting the lounge and bedroom. (NOTE: Undercarpets must be laid before carpeting.) (5)

2.4 The following items are to be installed in Jean's kitchen:

Electric stove	:	R3 299
3 x Cupboards	:	@ R 739 each
Sink	:	R789

As a result of the power cuts in the area Ms. Olivier decides to install a gas stove costing R3 999, instead of the electric stove. Ms Olivier only has R8000 to spend for the total fittings in her kitchen. Determine whether or not she will be able to afford the gas stove. Show all calculations. (7)

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QUESTION 3

3.1 The Umgeni Valley Nature Reserve lies in the heart of the KwaZulu Natal Midlands, near the Howick Falls. Refer to the map on ANNEXURE C to answer the questions which follow.

3.1.1 Give the grid reference for Inkonko Camp? (1)

3.1.2 In which general direction would you be travelling if you were going from Shelter Falls Camp to the main office? (2)

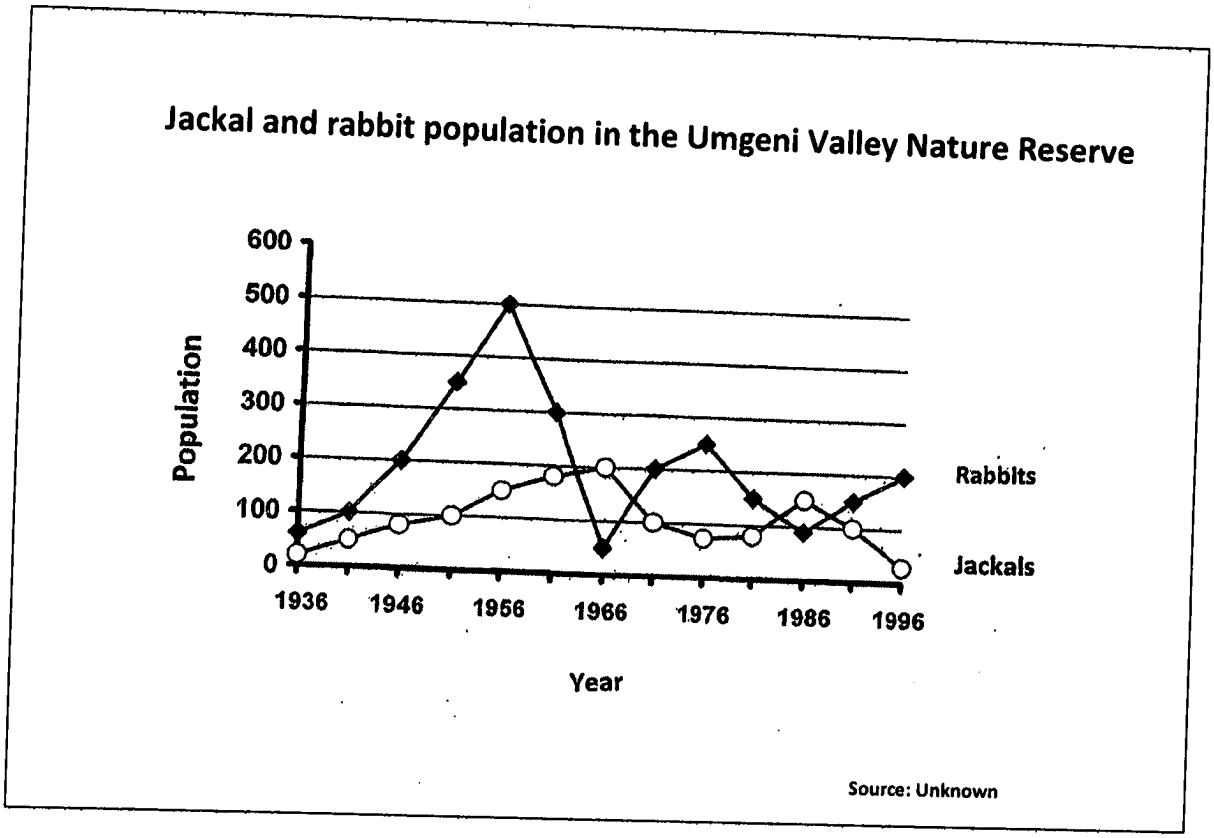
3.1.3 Calculate (to the nearest km) the distance as the crow flies, from the main office to Inkonka Camp. (4)

3.1.4 Calculate the actual area, in m^2, represented by one grid block on this map? (3)

3.1.5 The shaded area on the map represents wild vegetation. Estimate the total number of squares that the wild vegetation occupies on the North-Eastern region of the map. (2)

3.1.6 Use your answer in question 3.1.5 to calculate, in km^2, the total area, that the wild vegetation occupies on the north-eastern region of the map. *(Round off to one decimal place.)* (3)

3.2 The graph below shows the jackal and rabbit population over a period of time in the Umgeni Valley Nature Reserve.



Study the above graph and then answer the questions which follow:

3.2.1 During which year was the rabbit population to the jackal population the highest and what was the difference in population? (3)

3.2.2 During which year(s) was the population of both animals the same? (4)

3.2.3 During which periods in years were there more jackals than rabbits? (4)

3.3 During the Easter school holidays the traffic department carried out routine checks on 1000 vehicles traveling on the N3 towards Durban. The following defects were found:

Table showing defect rate of 1 000 vehicles	
VEHICLE PART	**DEFECTIVE RATE**
Steering system	1 out of 18 cars
Windscreen Wipers	1 out of 40 cars
Light Bulbs	1 out of 5 cars
Brakes	1 out of 10 cars
Exhausts	1 out of 25 cars
Tyres	1 out of 20 cars

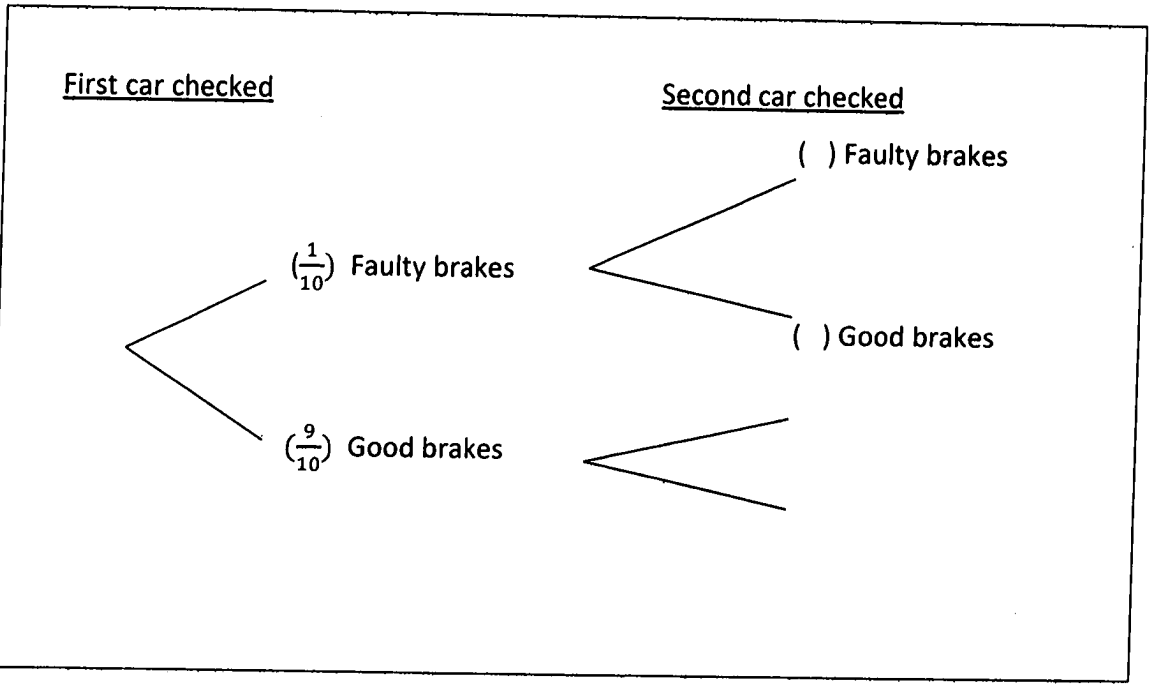
3.3.1 Determine which vehicle part was the least defective. (1)

3.3.2 Determine how many vehicles had defective brakes? (2)

3.3.3 Calculate the probability of a vehicle NOT having defective light bulbs. (1)

3.3.4 Two cars were randomly stopped and the brakes were checked.

Complete the tree diagram on **ANNEXURE A** showing all possible outcomes. (4)



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QUESTION 4

4.1 An identical test was given to Grade 12 learners in two different schools. The results were recorded as a mark out of 100. The learners' results are summarised in the following table:

SCHOOL A 199 learners wrote the test	
	Mark
Minimum	0
First quartile	0
Median	32
Third quartile	56
Maximum	65

SCHOOL B 180 learners wrote the test	
	Mark
Minimum	35
First quartile	40
Median	67
Third quartile	78
Maximum	100

4.1.1 Use the information provided in the table above to determine whether the following statements are true or false. In each case give reasons for your answer or correct the statements if necessary:

(a) Exactly 25% of the learners who wrote the test in School A did not get any answers correct. (2)

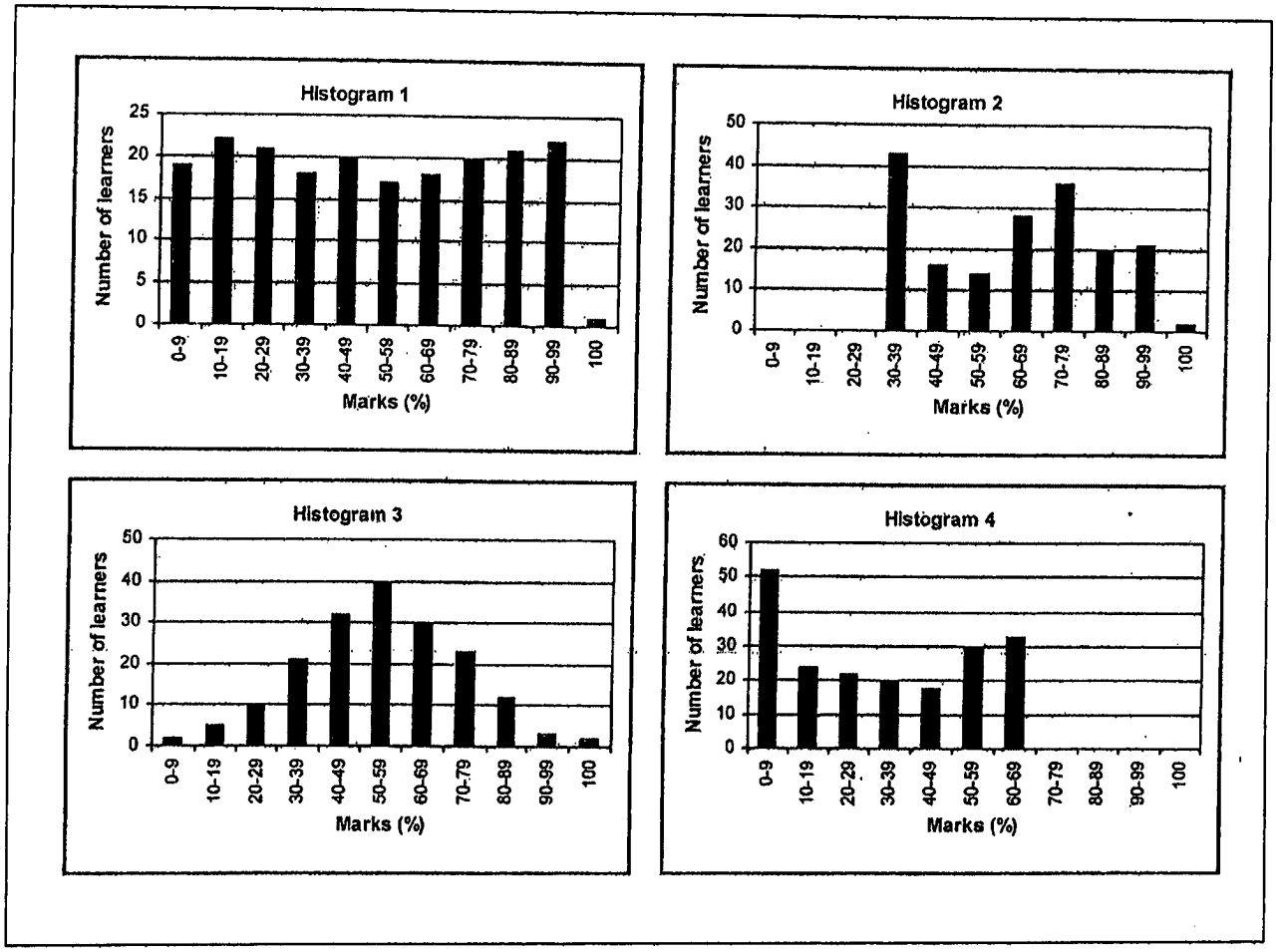
(b) At least half the learners in School B obtained over 50%. (2)

(c) The range of marks is the same for both schools. (2)

(d) At least 90 learners in School B obtained a mark higher than the best mark from School A. (2)

(e) A learner from School A obtained a mark that was between the 50^{th} and 70^{th} percentile of School B. (2)

4.2 Use the following histograms to answer the questions which follow:



State with reasons which histogram is most likely to represent the distribution of marks scored in the test for:

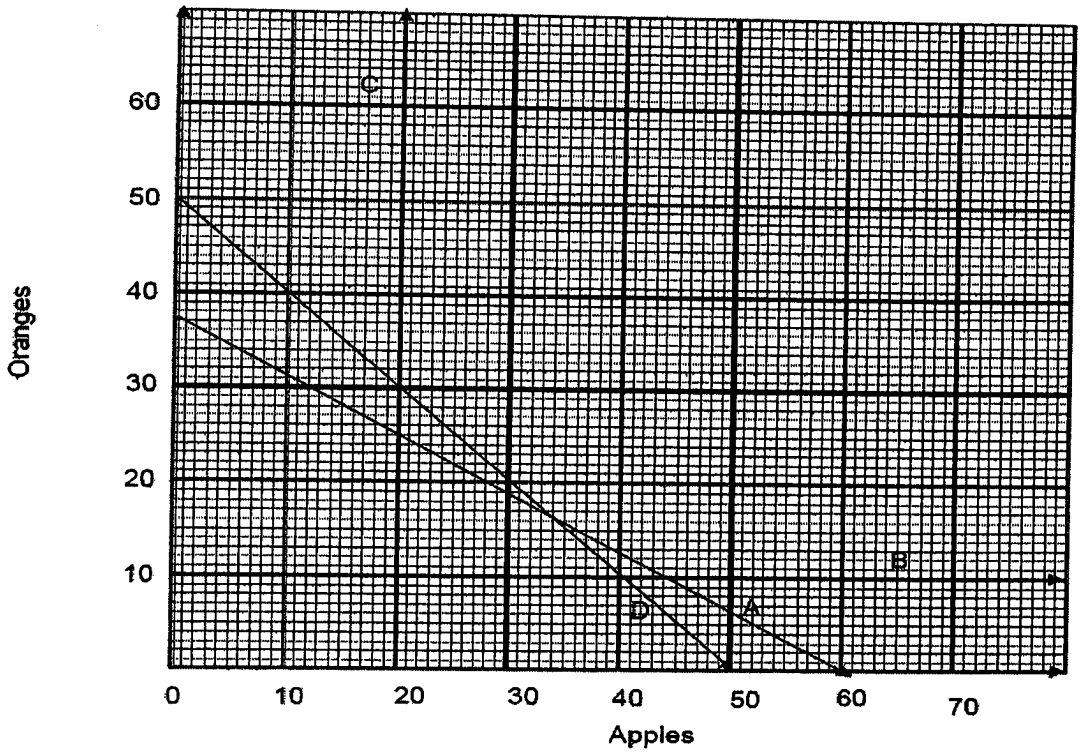
4.2.1 School A. (3)

4.2.2 School B. (3)

4.3 Nomsa, one of the learner's mum, is a fruit seller who sells only apples and oranges.

- Every day she has to sell a minimum of 10 apples and 20 oranges.
- She cannot sell more than 50 fruit of the two types combined in ONE day.
- An apple costs 50c and an orange costs 80c.
- Every day she can spend only R30 to buy fruit.
- She makes a profit of 15c on an apple and 20c on an orange.

Let the x-axis (or horizontal axis) represent the number of apples sold daily.
Let the y-axis (or vertical axis) represent the number of oranges sold daily.
The graphs below represent the constraints given in the above situation.
Use the graphs to answer the questions which follow:



4.3.1 Which of the straight lines (A – D) in the graph describes each of the following:

(Write only the letter depicting the graph)

(a) The minimum number of apples Nomsa has to sell daily. (2)

(b) The minimum number of oranges Nomsa has to sell daily. (2)

(c) The maximum number of fruit Nomsa could sell daily. (2)

(d) The maximum number of oranges and apples Nomsa will be able to buy daily. (2)

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QUESTION 5

A printing company has a choice of two options to dispatch parcels containing exam booklets to schools.

Option A - Postal Service

Domestic Parcel Rates
Counter to Counter
R24,36 for the first kilogram R3,28 for every additional kilogram or any part thereof

Option B – Local Courier Service.

Courier Service Rates	
First 15 kilograms or part there of	R 45,00
Thereafter for every 15 kilograms or any part thereof	R 10,00

5.1 Calculate the amount of postage for a parcel weighing 4,2 kg. (3)

5.2 Determine the cost of dispatching the same parcel by courier. (1)

5.3 The table below shows the total cost of the two options of dispatching parcels.

Dispatching of parcels

Number of kg	**5**	**10**	**20**	**30**	**35**	**40**
Postal cost(R)	37,48	53,88	86,68	**A**	135,88	152,28
Courier cost(R)	45	45	**B**	55	65	**C**

5.3.1 Derive a formula to determine the total cost of postage for a parcel if C represents the total cost of postage and "*n*" represents the number of kg exceeding 1kg. (2)

5.3.2 Calculate the missing values A, B and C. (7)

5.3.3 Use the table above to draw 2 line graphs on the grid provided on **ANNEXURE B**. Label your graphs correctly. (6)

5.3.4 Use your graphs to determine which option is cheaper if a 25 kg parcel is to be dispatched. (2)

5.3.5 The printing company would like to minimise their costs. How would you advise them to dispatch their parcels? (3)

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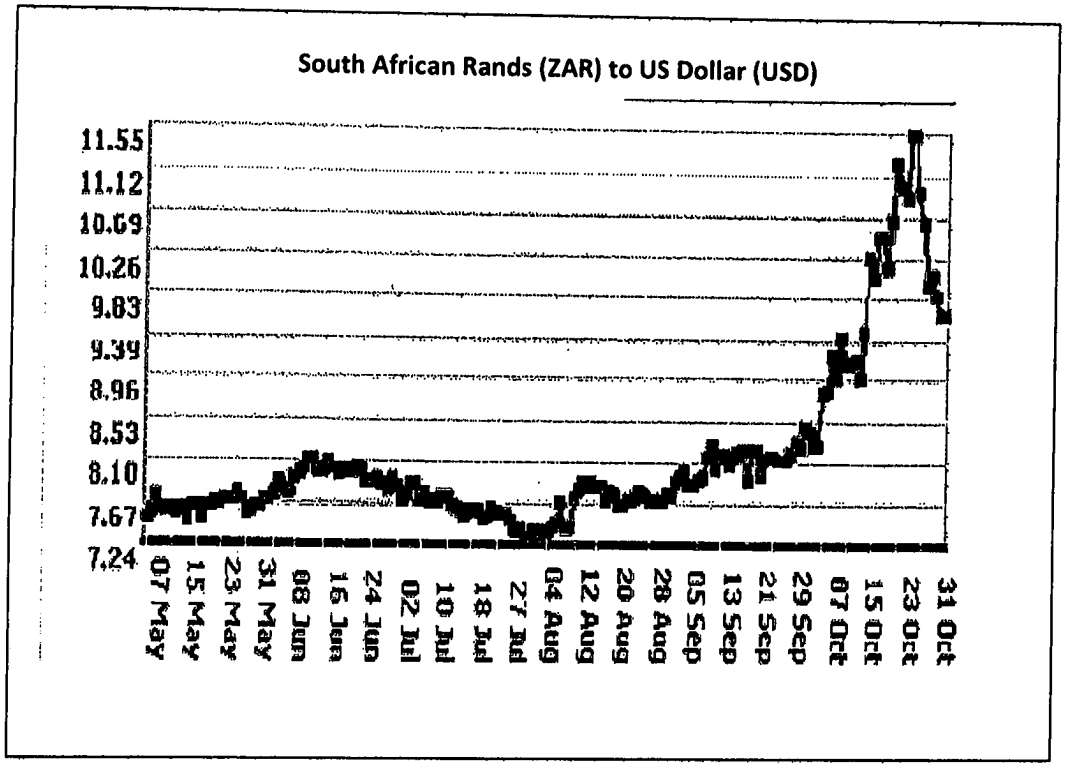
Question 6

6.1 The graph below shows the exchange rate between the South African Rand and the United States Dollar during 07 May 2008 to 31 October 2008.



Min = 7.24 (August,4) avg = 8.15 max = 11.6 (October , 25)

Study the above graph and then answer the questions which follow:

Noël, a South African citizen, travels frequently to the United States on business. He buys US Dollars from a bank in South Africa.

6.1.1 Determine in which month between May and October 2008 did he get the best exchange rate for his Rand. (2)

6.1.2 From 07 May to 29 September, the graph appears to have little variation. What could be the reason for this? (2)

6.1.3 Noël bought US Dollars from the bank during the week of the 29th September before he travelled to the US. The exchange rate was R 8,25 to the US Dollar. He was given $ 2 197 for R 18 125 (excluding bank charges). Did he receive the right amount of US Dollars for his money? Explain by showing all calculations. (4)

6.2 When he was about to return to South Africa on the 23rd of October 2008, he had $ 500.

Looking at the graph and considering the fact that Noël is a frequent traveler to the United States, what advice would you give Noël as to whether he should change his dollars to rand or not? (4)

[12]

TOTAL : 150