KWAZULU-NATAL PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 11

MATHEMATICAL LITERACY

COMMON TEST

MARCH 2022

This question paper consists of 9 pages,
1 answer sheet and an addendum with 2 annexures.

INSTRUCTIONS AND INFORMATION

1. This question paper consists of FOUR questions. Answer ALL the questions.

2. The question paper consist of two ANNEXURES AND ONE ANSWER SHEET

   2.1 Use the ANNEXURES in the ADDENDUM to answer the following questions:

   - ANNEXURE A for QUESTION 2.1
   - ANNEXURE B for QUESTION 3.2

   2.2 Answer QUESTIO
   N 4.1.2 on the attached ANSWEER SHEET.

   2.3 Write your name and surname in the spaces on the ANSWER SHEET. Hand in the ANSWER SHEEt with your ANSWER BOOK

3. Number the answers correctly according to the numbering system used in this question paper.

4. Start EACH question on a NEW page.

5. You may use an approved calculator (non-programmable and non-graphical). Unless stated otherwise.

6. Show ALL the calculation clearly.

7. Round off ALL the final answers appropriately according to the given context, unless stated otherwise.

8. Indicate units of measurements, where applicable.

9. Diagrams are NOT necessary drawn to scale, unless stated otherwise.

10. Write neatly and legibly.

QUESTION 1

1.1

Mr Lunga works as a bricklayer; he works 6.5 hours a day and charges R110 per hour or part thereof

1.1.1 Convert 6.5 hours to hours and minutes. (2)

1.1.2 Explain the term part thereof according to the given context. (2)

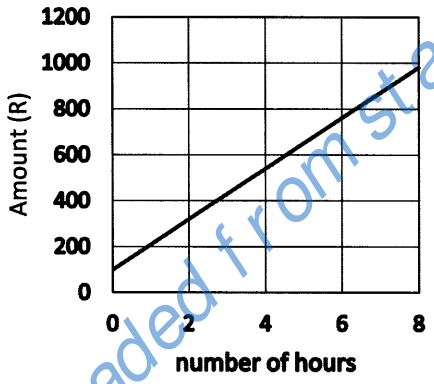
1.1.3 Determine the total amount of money Mr Lunga will receive per day, if he works 6,5 hours. (3)

1.1.4 Calculate the number of hours worked for a total income of R440 received. (2)

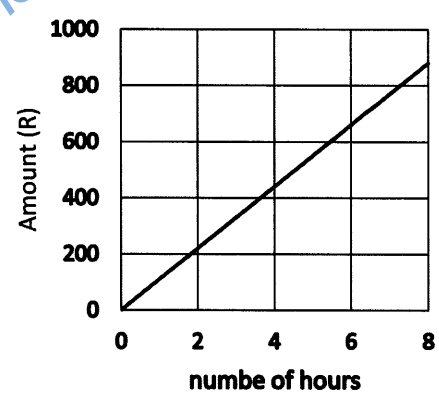
1.1.5 Which of the following graphs below will represents Mr Lunga's total charge per hour?

Write ONLY a letter that represent the correct graph. (2)

A

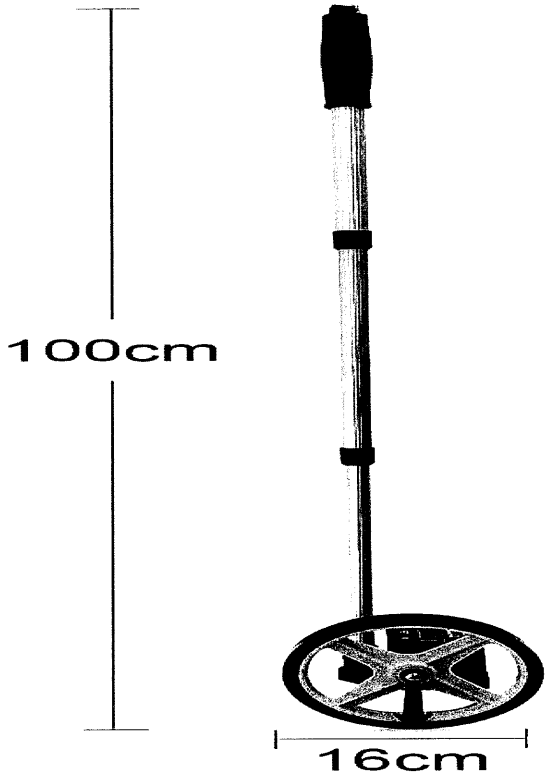


B



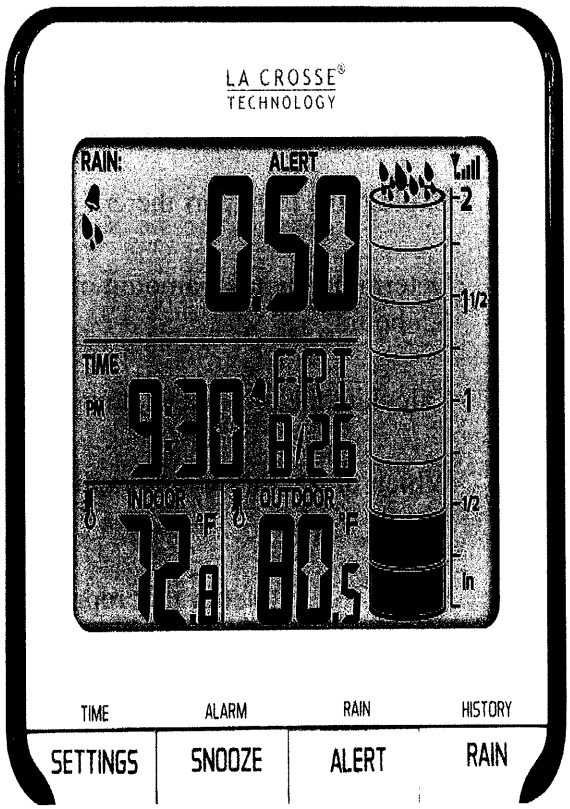
1.2 Tom is a farmer he uses the following tools to measure lengths and rain in his farm.

Trundle wheel



[Source: https://reliablestore.co.za/products/]

Digital Rain gauge



[Source: http//ebayimg.com]

Use the information above to answer the questions that follow.

1.2.1 Write down the radius of the trundle wheel in cm. (2)

1.2.2 The circumference of the wheel is approximately 50,3cm.
Determine the total length Tom measured, if it rolled 30 times. (2)

1.2.3 Give the rain gauge reading displayed on Friday 26 August. (2)

1.2.4 Calculate the difference in outdoor temperature and indoor temperature readings given on the rain gauge. (3)
[20]

QUESTION 2

2.1 ANNEXURE A shows the bank statement for miss MJ Smith.

Use ANNEXURE A to answer the question that follow.

2.1.1 Define the term "*opening balance*" with reference to bank statement. (2)

2.1.2 Write down the closing balance on 18th April 2021. (2)

2.1.3 Calculate the total amount deposited between the 8th of April 2021 to the 14th of April 2021. (3)

2.1.4 Determine the number of days covered by this statement. (3)

2.1.5 Show by calculations using the account summary, how the closing balance of R5719,47 was calculated. (3)

2.2 Study an extract of ABC Teleking income and expenditure business for the month.

Income	**A**	**Expenses**	**R24 510**
Consultancy	R25 000	Freelancers	R1 200
Guides	R17 500	Telephone	R2 000
		Marketing	R2 000
		Travel	R1 500
		Office Suppliers	R3 210
		Bank charges	R 500
		Bank interests	R 500
		Repair expense	R1 500
		Insurance	R600
		Wage expense	R8 000
		Water and electricity	R3 500
TAXABLE BUSINESS PROFITS		**R17 990**	

2.2.1 Calculate the value of **A**, the total income for the business. (2)

2.2.2 Name ONE example of the running expense from ABC Teleking. (2)

2.2.3 Express the marketing expense as the percentage of the taxable profit. (3)

2.2.4 ABC Teleking offers an installation of the landline that charges R160 for the first 100 minutes talk-time and R0,80 per minute thereafter.

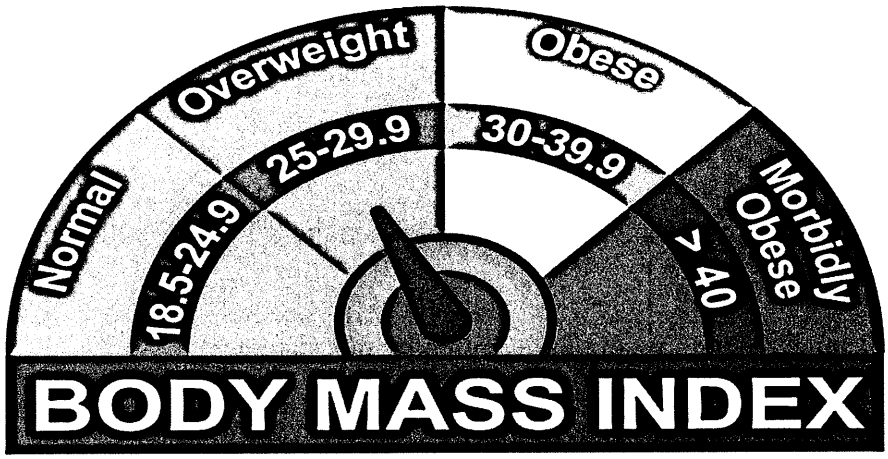
(a) Determine the total cost of 120-minute talk-time. (3)

(b) State which relation between a **combination relations** and **inverse relation** will be the best to represent ABC Teleking installation charge. (2)

[25]

QUESTION 3

3.1 Mr Looney is tracking his body weight using the body mass index radar. He is currently weighing 83,5kg with a height of 1,7m.



[source: https://www.wltx.com/article/news/health]

Use the information and the BMI radar above to answer the questions that follow.

3.1.1 Identify Mr Looney's weight status as indicated on the radar. (2)

3.1.2 Calculate his body mass index round off to the nearest 1 decimal.

You may use the formula: $\mathbf{BMI} = \frac{\mathbf{Weight\ in\ kg}}{\mathbf{(height\ in\ metres)^2}}$ (4)

3.1.3 Give any TWO advices Mr Looney should consider in order to be classified as normal. (4)

3.1.4 Convert Mr Looney's weight to pounds if 1kg = 2.2 pounds. (2)

3.2 ANNEXURE B shows the diagram of the tennis court with dimensions in metres. Study the diagram in ANNEXURE B and answer the questions that follow.

3.2.1 Show by calculations that the width of the base line is 10.97m. (2)

3.2.2 Hence, Calculate the perimeter of the whole tennis court.

You may use the formula: **Perimeter of rectangle = 2× length +2× width** (3)

3.2.3 Determine the length between baseline and the service line in metres. (4)

3.2.4 Calculate the area of ONE doubles alley in square metres.

You may use the formula: **Area of a rectangle = length × width** (3)

3.3

On average a male tennis player with a weight of 70kg can burn approximately 583 calories per hour in a tennis games.

3.3.1 Determine how many calories will a male tennis player with 83.5kg in one hour. (3)

3.3.2 A male tennis player with a weight of 83.5kg will lose more than 0.077kg, if he plays consistently the tennis game.

Verify this statement showing all calculations if 1 gram = 9 calories. (4)

3.3.3 Calculate the number of hours a tennis player needs to play in order to lose 1600 calories. (2)

[33]

QUESTION 4

4.1 Anna owns a small bakery in her home, she pays R375 for electricity and water to her parents every month. TABLE 1 below shows her total monthly income and expenses for one month. The cost to produce one bread is R5.00

TABLE1: Anna's Monthly income and expenses

Number of breads	**0**	**10**	**20**	**30**	…	**100**	**150**	**200**
Expenses(R)	375	425	475	525	…	875	1125	1375
Income(R)	0	125	250	375	…	1250	1875	2500

Use TABLE 1 and information to answer the questions that follow.

4.1.1 Identify the dependant variable represented in TABLE1 above. (2)

4.1.2 The graph for Anna's total income has been drawn in ANSWER SHEET.

(a) Draw another graph showing the total expenses using TABLE 1. (3)

(b) Using your graph, determine how many breads Anna needs to produce in order to break even. (2)

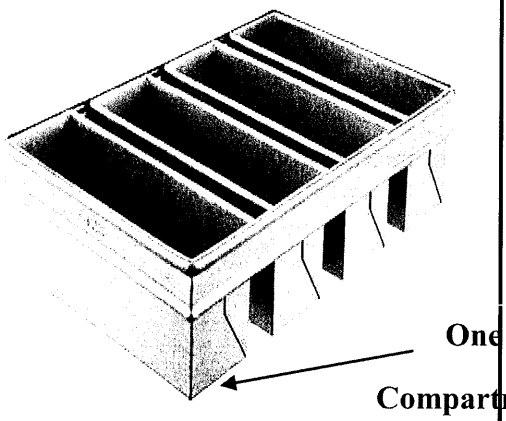
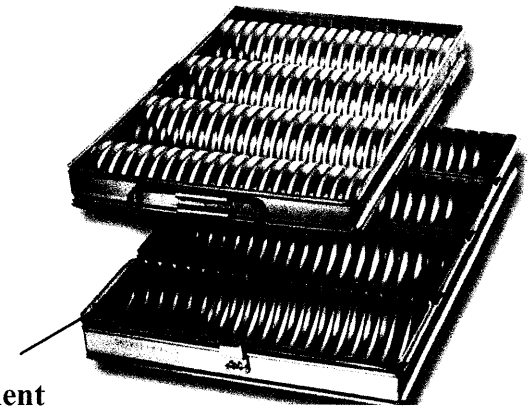
(c) Determine using your graph the total expenses, if she produces 120 breads. (2)

4.1.3 The equation to calculate Anna's total expenses is given as:
Total expenses = R375 +R5 ×no. of breads produced.

Write down the equations to calculate her total income in the form of:
Total income = ... ×x number of breads sold (2)

4.2

Anna uses a FOUR division type bread pan to bake her breads.

Dimensions of each rectangular compartment pan	**Dimensions of each cylindrical compartment pan**
	
Length = 40cm **Width = 10cm** **Height = 10cm**	**Height =42,5cm** **Radius = 5,08cm** [Source: http://www.sheetmetalprocess.com/sale]

Use the information above to answer the questions that follow.

4.2.1 Calculate the volume of all four rectangular bread compartments.
You may use the formula:
Volume of a rectangular prism = length × width × height ×4 (3)

4.2.2 The volume of ONE cylindrical bread compartment is 3 501,19cm^3.

Determine in grams which compartments between a cylindrical and a rectangular bread pan will have more mass. **Note:** 1g = 1cm^3. (3)

4.2.3 Write down the unit ratio of the radius of a cylindrical compartment to the length of rectangular compartment. (2)

4.2.4 Anna bakes her breads in an oven that is heated to standard temperature of 450°F.

Convert the temperature to degree Celsius using the following formula.
$°C = (°F - 32°) \div 1.8$ (3)

[22]

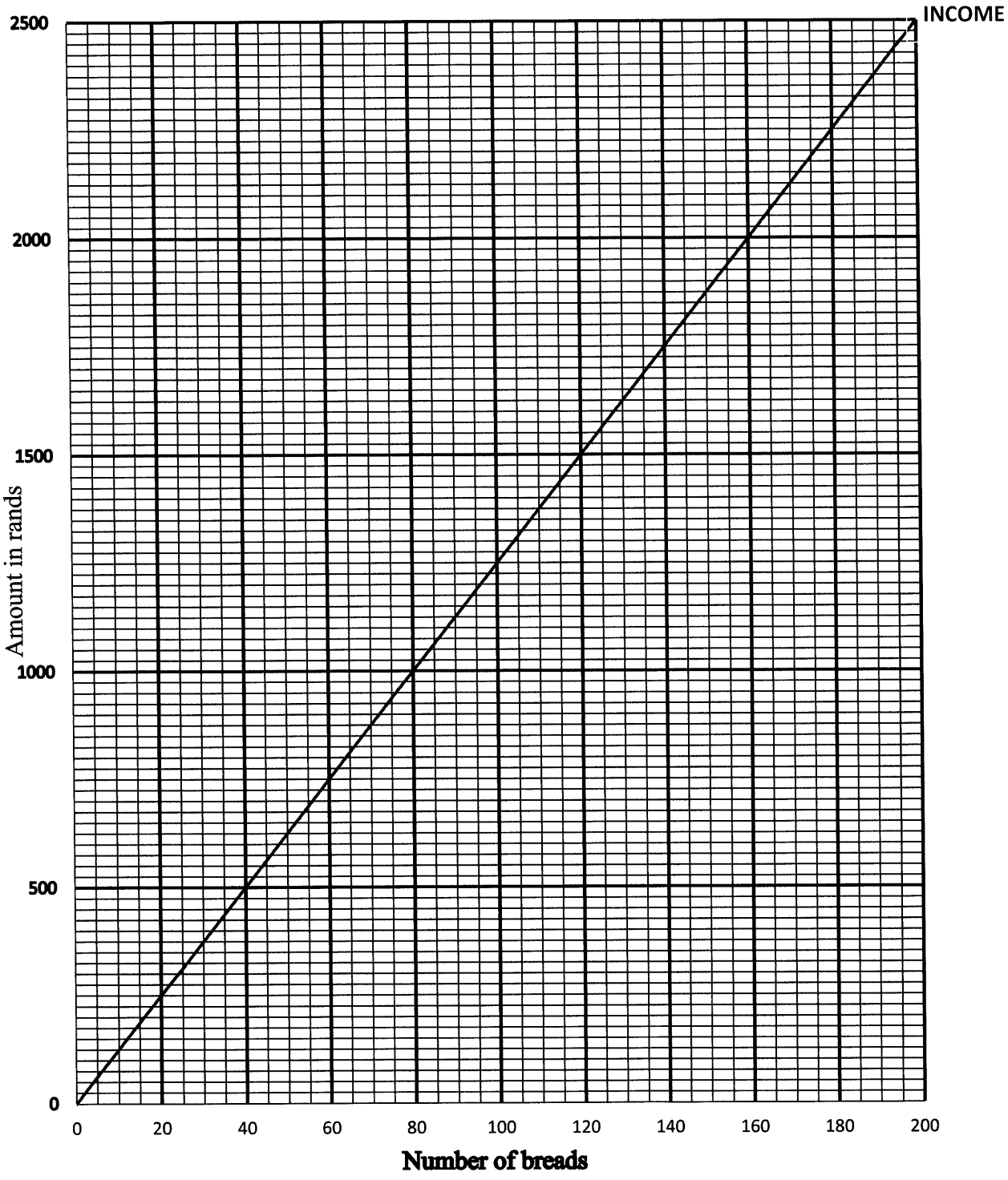
TOTAL MARKS: 100

ANSWER SHEET

QUESTION 4.1.2

NAME & SURNAME_____**GRADE 11**___

ANNA'S TOTAL INCOME AND EXPENSES



TEAR – OFF SHEET

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ADDENDUM

MARCH 2022

This addendum consists of 3 pages with 2 annexures.

ANNEXURE A

Question 2.1

CROWDTECH BANK STATEMENT

Ms MJ Smith
100 Pine Street
Metro west
AA 09371

For 15 Mar 2021 to 18 Apr 2021
Account number
00-1235678
Branch Transits Number
075 097 8765

Account Summary	
Opening balance	R5 234,09
Withdrawals	R2 387.07
Deposits	R2 872,45

Contact information
Crowdtech@bankxa.com
Contact by phone for questions, general enquiries 24/7

Closing Balance on 18 Apr. 2021
R5 719,47

Main branch
100 Main Street
Metro east
AA 09370

You are eligible for R100 bonus

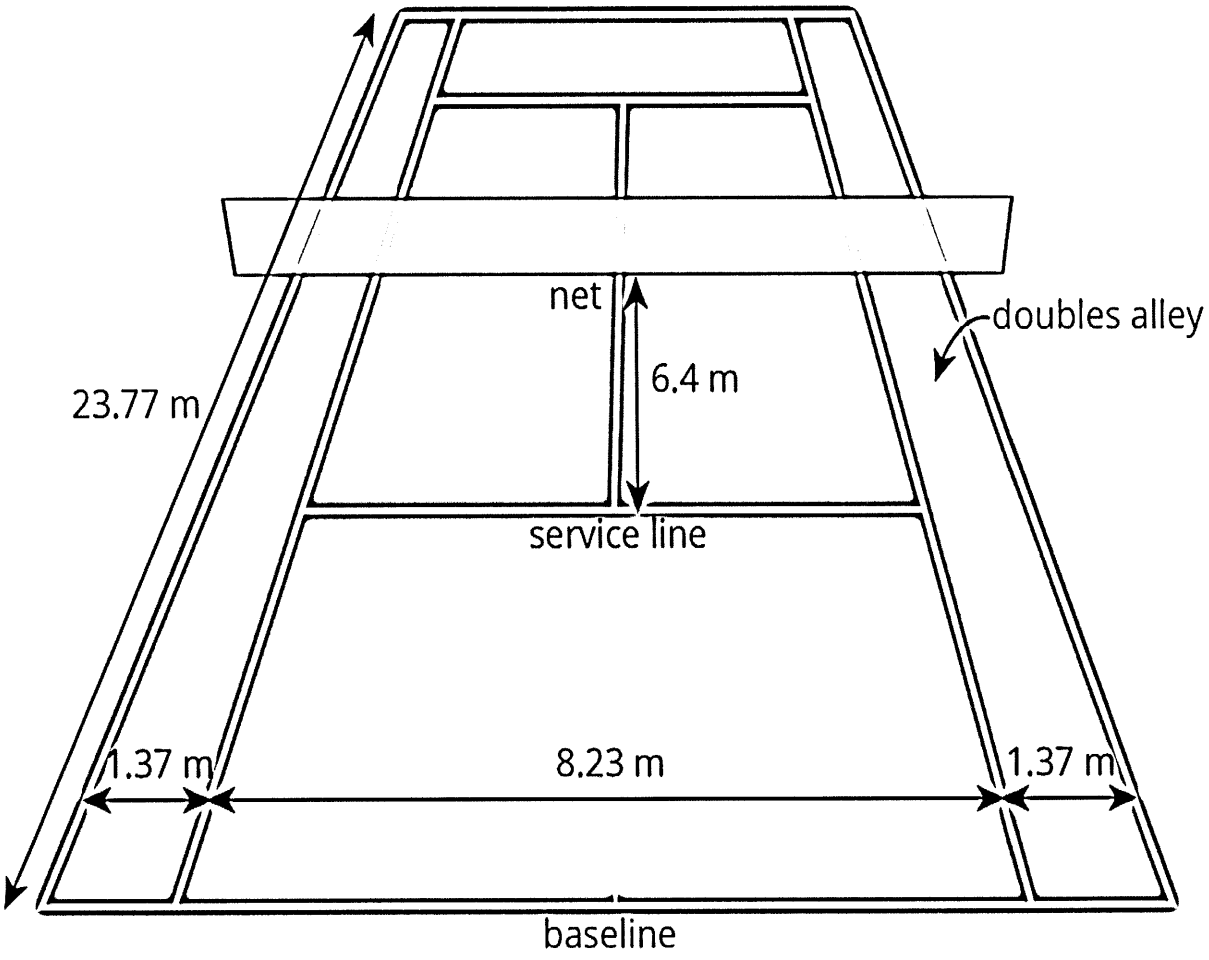
Your Transactions Details

Date	Details	Withdrawals	Deposits	Balance
8 Apr	Opening Balance			5 234,09
8 Apr	Insurance		272,45	5 506,54
10 Apr	ATM	200,00		5 306,54
12 Apr	Internet Transfer		250,00	5 556,54
12 Apr	Payroll		2 100,00	7 656,54
13Apr	Bill payment	135,07		7 521,47
14 Apr	Direct debit	200,00		7 321,47
14Apr	Deposit		250,00	7 571,47
15Apr	Bill payment	525,72		7 045,75
17 Apr	Bill payment	372,63		6 673,12
17 Apr	Bill payment	729,96		5 943,16
18Apr	Bill payment	223,69		5 719,47
	Closing balance			XXXXX

ANNEXURE B

Question 3.2

TENNIS COURT



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MARCH 2022

MARKING GUIDELINE

MARKS: 100

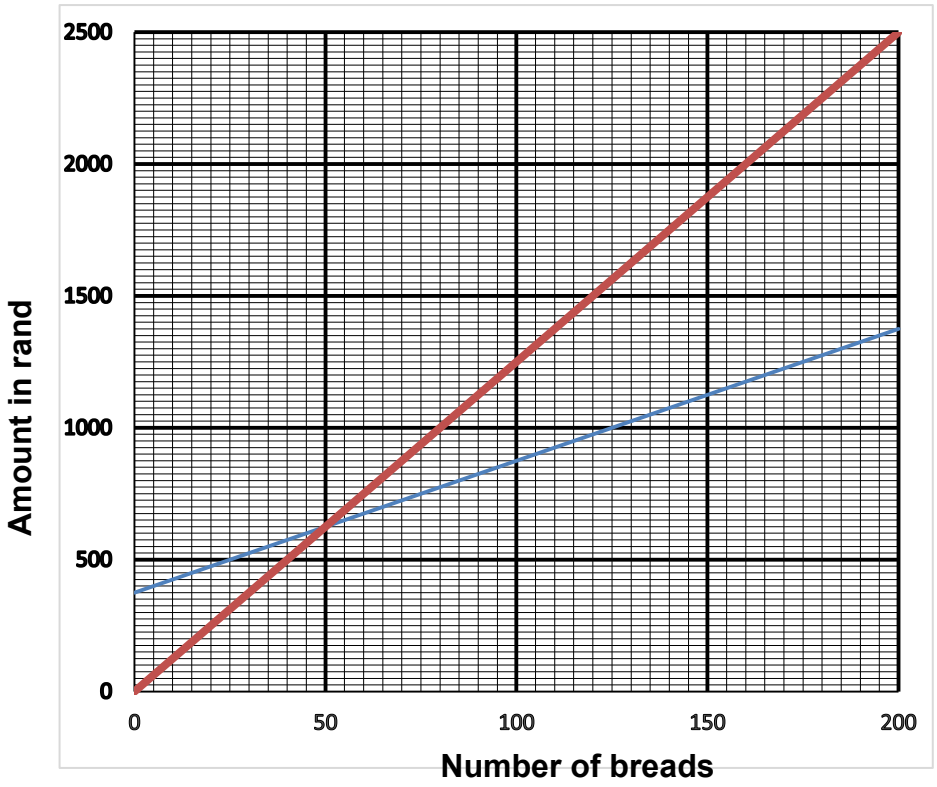
SYMBOL	EXPLANATION
M	Method
MA	Method with accuracy
CA	Consistent accuracy
A	Accuracy (Answer)
C	Conversion
S	Simplification
RT/RG/RD	Reading from a table/ graph/ diagram
NPR	No penalty for units/rounding
SF	Correct substitution in a formula
O	Opinion/ reason/deduction/example
J	Justification
R	Rounding off/
F	deriving a formula
E	Explanation
U	Units
AO	Answer only full marks

This marking guideline consists of 6 pages.

QUESTION 1 [20 MARKS]			
	SOLUTION	**EXPLANATION**	**T/L**
1.1.1	6hours +0,5×60 ✓MA 6hrs and 30minutes✓A	1MA, Multiplying by 60 1A, Time in hours and minutes (2)	M L1
1.1.2	It means that the 30 minutes will be charged at R110. ✓✓**E**	2E, Explanation (2)	M L1
1.1.3	✓M Income = R110×6 +R110 ✓MA =R770✓CA	1M, Multiplying by 6 1MA, Adding R110 1CA, Answer (3)	F L1
1.1.4	No of hours = $\frac{R440}{R110}$ ✓MA =4 ✓A	1MA, Dividing by the rate 1A, Answer (2)	M L1
1.1.5	B ✓✓A	2A, Correct graph (2)	B L1
1.2.1	Radius =$\frac{16cm}{2}$ ✓MA =8cm✓A	1MA, Dividing by 2 1A. Answer **AO** (2)	M L1
1.2.2	Total length = 50,3cm ×30✓ M =1 509cm✓CA	1M, Multiplying by 30 1CA, Answer **AO** (2)	M L1
1.2.3	0,5 inches ✓✓RT **OR** $\frac{1}{2}$ inch✓✓RT	2RT, Correct reading (2)	M L1
1.2.4	✓RT ✓M Difference = 80,5 – 72,8 =7,7 ^{o}F ✓CA	1RT, Reading correct values 1M, Subtracting correct values 1CA, Difference (3)	M L1
		[20]	

QUESTION 2 [25 MARKS]			
	SOLUTION	**EXPLANATION**	**T/L**
2.1.1	Opening balance is a balance brought forward from the previous account period. ✓✓E	2E, Explanation (2)	F L1
2.1.2	Balance = R5 719,47✓✓A	2A, Answer (2)	F L1
2.1.3	✓RT ✓M Total deposits =R272,45 +R250+R2100+R250 =R2 872,45✓CA	1RT, Reading correct values 1M, Adding correct values 1CA, Answer (3)	F L2
2.1.4	✓MA Days = (31 – 15) +1+18 = 17+18✓M =35 days✓CA	1MA, Days in March 1M, addition 1CA, Answer. (3)	M L2
2.1.5	✓RT ✓ MA ✓ MA Closing balance = R5 234,09-R2387,07 +R2872,45 = R5 717,47	**CA from question2.1.3** 1RT, Opening balance. 1MA, Subtracting withdrawals 1MA, Adding deposits (3)	F L2
2.2.1	✓M Income = R25 000+ R17500 =R42 500✓A	1M, Adding correct values 1A, Answer **AO** (2)	F L1
2.2.2	Water and electricity✓✓A	2A, Answer (2)	F L1
2.2.3	Markerting exp%= $\frac{R2000}{R17990}$ × 100%✓M =11,12%✓MA	1M, Dividing Correct values 1M, Percentage concept 1CA, Answer **NPR** (3)	F L2
2.2.4	a) ✓MA Total cost = R160 +R0,80×20✓M =R176✓CA	1MA, Multiplying by 20minutes 1M, Addition 1CA, Answer (3)	F L3
2.2.4	b) Combination relation ✓✓A	2A, Answer (2)	B L1
		[25]	

QUESTION 3 [33 MARKS]			
	SOLUTION	**EXPLANATION**	**T/L**
3.1.1	Overweight. ✓✓RT	2RT, Correct answer (2)	M L2
3.1.2	BMI = $\frac{83,5kg}{(1,7m)^2}$✓✓SF =28,8927✓CA =28,9kg/m^2✓R	2SF, Substitution correct weight and height 1CA, Answer 1R, Rounding (4)	M L3
3.1.3	Exercise regularly ✓✓O **OR** Eat healthy food ✓✓O **OR** Follow the diet programme✓✓O	2O, Opinion 2O, Opinion (4)	M L4
3.1.4	Weight in pounds = 2,2 ×83,5 ✓MA =183,7 pounds✓A	1MA, Multiplication by 2,2 1A, Answer **AO** (2)	M L2
3.2.1	✓M ✓M Width of the baseline = 8,23m+1,37m+1,37m = 10,97m	1M, Addition 1M, Adding 1,37m both sides (2)	M L2
3.2.2	✓SF ✓A P = 2×23,77m +2×10,97m = 69,48m✓CA	1SF, Substitution 1A, Correct values 1CA, Answer (3)	M L2
3.2.3	✓M 23,77m – 6,4m-6,4m $\frac{10,97m}{2}$✓MCA ✓MA 5,485m✓CA	1M, Subtracting both sides 6,4m 1MCA, 10,97m 1MA, Dividing by 2 1CA, Answer (4)	M L4
3.2.4	✓SF Area =23,77m×1,37m ✓M =32,5649m^2✓CA	1SF, Substitution 1Multiplying 1CA, Answer. (3)	M L2
3.3.1	No of calories = $\frac{83,5kg}{70kg}$ × 583✓M ✓S = 695,44calories ✓A	1M, Multiplying by 583 1S, Dividing by 70 kg 1A, Answer. (3)	M L3
3.3.2	Mass = $\frac{695,44 \text{ calories}}{9}$✓MA = $\frac{77,27711g}{1000}$✓C = 0,077kg ✓A The statement is invalid. ✓J	**CA from Question 3.3.1** 1MA, Dividing by 9 1C, Dividing by 1000 1A, Answer 1J, Justification (4)	M L4
3.3.3	No of hours = $\frac{1600}{583}$✓M =2,744✓A	1M, Dividing by 583 1A, Answer **NPR** (2)	M L3
		[33]	

QUESTION 4 [22]			
	SOLUTION	**EXPLANATION**	**T/L**
4.1.1	Amount in rands✓✓RT	2RT, Answer (2)	F L1
4.1.2	a) 	1A, Starting point 1CA, Joining straight line point 1CA, Label (3)	F L3
4.1.2	b) 50 breads✓✓RT	2RT, Answer (2)	F L2
4.1.2	c) R975✓✓RT	2RT, Answer (2)	F L2
4.1.3	Income for one bread = $\frac{R125}{10}$ =R12,50✓M Total income = R12,50 ×No of bread sold✓CA	1M, Rate of R12,50 1CA, Equation (2)	F L3
4.2.1	Volume = 40cm ×10cm×10cm ×4 ✓✓SF =16 000cm^3✓A	2SF, Correct Substitution 1A, Answer (3)	M L3

4.2.2	Rect. =16 000g✓C Cylindrical = 3501,19×4✓MA =14004,76g A rectangular compartment will have more mass✓CA	**CA from question 4.2.1** 1C, Conversion of cm^3 to grams 1MA, Multiplying by 4 1CA, Opinion (3)	M L4
4.2.3	5,08cm :40cm✓MA 5,08cm 5,08cm 1:7,874…✓CA	1MA, Correct ratio order and dividing 1CA, Answer **AO** (2)	M L2
4.2.4	℃= (450-32) ÷1,8✓SF =418÷1,8✓S =232✓CA	1SF, Substitution 1S, Simplification 1CA, Answer (3)	M L2
		[22]	
		TOTAL MARKS: 100	