basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 10

MATHEMATICAL LITERACY P2

EXEMPLAR 2012

MARKS: 75

TIME: 1½ hours

This question paper consists of 7 pages and 3 annexures.

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INSTRUCTIONS AND INFORMATION

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

2. Answer QUESTION 4.2.3 on the attached ANNEXURE C. Write your name and grade in the spaces provided on the annexure and hand in the annexure with the ANSWER BOOK.

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

4. You may use an approved calculator (non-programmable and non-graphical), unless stated otherwise.

5. Show ALL the calculations clearly.

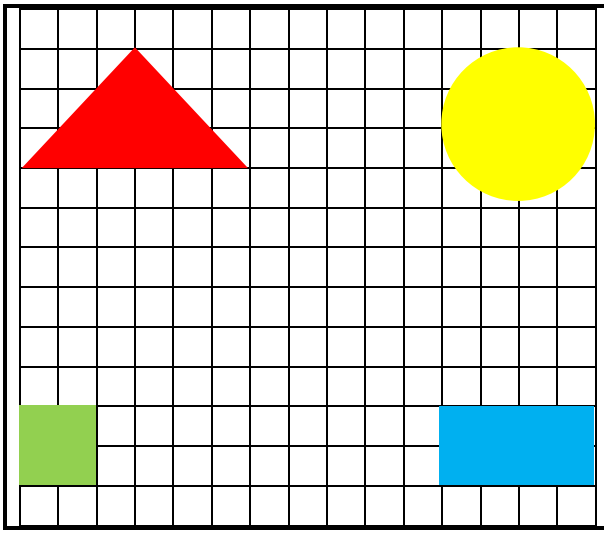
6. Round off ALL the final answers to TWO decimal places, unless stated otherwise.

7. Start EACH question on a NEW page.

8. Write neatly and legibly.

QUESTION 1

An Arts and Culture teacher at Little Tots Primary School wants to decorate part of the playground by painting a triangle, a circle, a rectangle and a square onto a tiled area on their playground. She intends playing a game with the learners whereby she calls out a shape and the learners then have to go to that decorated shape on the playground.



The triangle is 6 tiles long and 3 tiles high.

The circle has a diameter of 4 tiles.

The rectangle is 4 tiles long and 2 tiles high.

The square is 2 tiles high.

Each tile on the playground is a square with a length of 15 cm.

TABLE WITH FORMULAE

Circumference of a circle = $\pi \times$ diameter

Area of a circle = $\pi \times (\text{radius})^2$

Area of a rectangle = length $\times$ width

Area of a triangle = $\frac{1}{2} \times$ base $\times$ height

Use π = 3,142 where applicable.

1.1 In order to work out how much paint will be needed to paint these shapes, the teacher uses the formulae above to calculate the area occupied by each figure.

Use the appropriate formula to calculate the area of:

1.1.1 The triangle (3)

1.1.2 The circle (4)

1.2 The teacher needs to lay a decorative tape on the edges of the rectangle and the square.

1.2.1 Calculate the minimum length of the tape she needs to buy. (4)

1.2.2 Calculate the amount she will pay for the tape if the tape costs R19,50 per metre. (2)

[13]

QUESTION 2

Study the electricity account on ANNEXURE A and answer the following questions:

2.1 The Msunduzi Municipality charges a basic electricity cost, and then on top of that charges for the amount of electricity consumed.

2.1.1 What is the tariff charged for 40 ampere single-phase electricity? (2)

2.1.2 Calculate the value of **A**, the amount owing (excluding VAT) for 40 ampere of single-phase electricity. (2)

2.2 The total amount charged for sewerage was R116,28, including VAT. For domestic sewerage, a flat rate, **C**, is charged. Calculate **C**, the amount charged for domestic sewerage, excluding VAT. (3)

2.3 According to the account statement, the total VAT to be paid is R140,96.

2.3.1 Explain why this amount is not 14% of the total due. (2)

2.3.2 Show, with calculations, how the VAT of R140,96 was calculated. (3)

2.4 The residential rate under Assessment Rates is 1,89% of the rateable value of the property. Rates are calculated annually, but paid monthly. The monthly charge (excluding rebates) is R732,38. Calculate the value of **E**, the annual rateable value of the property.

The following formula may be used:

$$\textbf{Monthly rates} = \textbf{Residential rate} \times \frac{\textbf{Rateable value (E)}}{\textbf{12}}$$ (3)

2.5 Water consumption in Msunduzi Municipality is charged as follows:

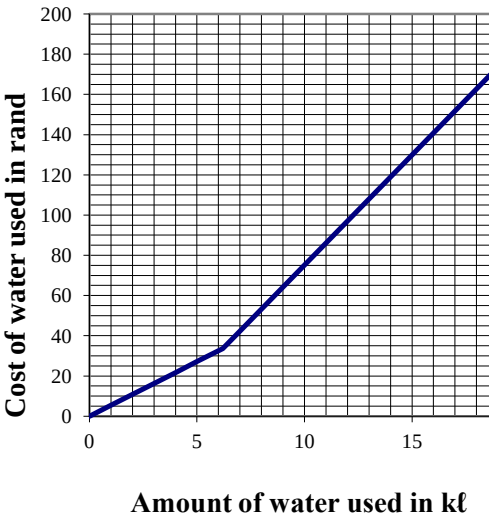
- The first 6,20 kℓ is charged at a tariff of R5,42 per kℓ.
- The rest of the water used is charged at a tariff of R10,94 per kℓ.

2.5.1 Suppose you know the amount of water used at this house in a particular month.

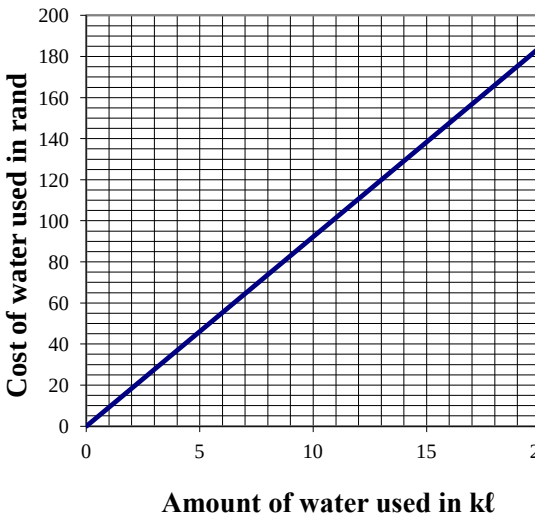
Write down an equation that can be used to calculate the amount that they will be charged for the water. (3)

2.5.2 The equation in QUESTION 2.5.1 can be represented graphically. Two graphs are given below. Which graph (GRAPH A or GRAPH B) graph represents the equation given in QUESTION 2.5.1? Explain your choice.

GRAPH A: Cost of water



GRAPH B: Cost of water



(4)

2.6 The table below shows electricity consumption of this household for the past twelve months.

Month	**Jan.**	**Feb.**	**Mar.**	**Apr.**	**May**	**Jun.**	**Jul.**	**Aug.**	**Sep.**	**Oct.**	**Nov.**	**Dec.**
Electricity consumption (in kWh)	740	700	720	769	815	830	820	800	765	712	745	770

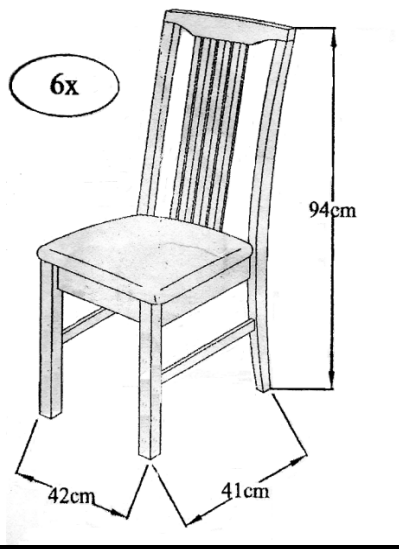
2.6.1 Calculate the mean (average) electricity consumption per month for this household. (3)

2.6.2 Give TWO reasons why the electricity consumption was the highest in June. (2)

2.6.3 Determine the probability that the electricity consumption in the table above is less than 710 kWh. (2)

[29]

QUESTION 3

Mrs Wessels bought a set of six dinner chairs. She now has to assemble the chairs. The picture alongside shows an assembled chair. ANNEXURE B shows the pieces and the desired quantities required to assemble the chair and the steps to follow to assemble the chair.	

3.1 Use ANNEXURE B to determine the number of JCBC screws (F) required to assemble ONE chair. (2)

3.2 By referring to the picture of the chair above, determine which part(s) of the chair (from ANNEXURE B) are still to be fitted onto the chair in STEP 2 of ANNEXURE B. (3)

3.3 Describe, in words, the instructions for assembling the chair as indicated in STEP 1 of ANNEXURE B. (4)

3.4 According to the diagram of the assembled chair, the chair occupies a floor area of 42 cm $\times$ 41 cm.

Calculate the minimum floor area occupied by each chair.

Use the following formula:

Area = length $\times$ breadth (3)

3.5 The actual height of the chair as indicated on the diagram is 94 cm.

Calculate the scale height of the chair if the scale used on the diagram is 1 : 23,5. (2)

[14]

QUESTION 4

Ms White, a Grade 10 Mathematical Literacy teacher at Umsobomvu High School, recorded the results (as a percentage) of her class test as follows:

56	58	38	70	30	56	67	85	32	25
58	35	74	67	84	30	76	58	35	29

4.1 Use the information above to answer the following questions:

4.1.1 Calculate the modal percentage of the class. (2)

4.1.2 Calculate the range of the results. (2)

4.1.3 Determine the median percentage of the class. (3)

4.2 Learner's performance is summarised using a rating code.

The results of the Grade 10 Mathematical Literacy learners in Ms White's class is summarised below in TABLE 1.

TABLE 1: Rating code with summary of learners' performance

Rating code	Description of competence	Percentage	Frequency
7	Outstanding achievement	80–100	2
6	Meritorious achievement	70–79	3
5	Substantial achievement	60–69	2
4	Adequate achievement	50–59	5
3	Moderate achievement	40–49	**P**
2	Elementary achievement	30–39	**Q**
1	Not achieved	0–29	2

4.2.1 Determine the values of **P** and **Q**. (3)

4.2.2 Determine the probability that a learner selected at random from Ms White's class scored 60% or more for the test. Write the solution in decimal form. (3)

4.2.3 Complete the bar graph drawn on ANNEXURE C, using the information in TABLE 1. (3)

4.2.4 Ms White offered an amount of R600 as a reward to be shared amongst all learners with a rating code of 6 or 7 in the ratio 2 : 3 respectively.

How much will each of the learners with a rating of 7 get? (3)
[19]

TOTAL: 75

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ANNEXURE A

QUESTION 2

	Msunduzi Municipality TAX INVOICE VAT REGISTRATION NO. 4600107835	A.S. Chetty Centre, 333 Church Street, Pietermaritzburg, 3200 ✉ 261 Pietermaritzburg, 3200 ☎033 392 2300 Fax: 033 392 2517
ACCOUNT NO. 007237081	ACCOUNT DATE 30/11/2011	ENQUIRIES CALL CENTRE ☎ 033 392 2980

STREET ADDRESS/STAND

PMB – PIETERMARITZBURG
3 JENKINS ROAD

LOCATION **PMB – PIETERMARITZBURG**

PROPERTY DESCRIPTION
17712/100

VAT REGISTRATION NUMBER 4600107835
TAX INVOICE 201111007237081

CASH **0.00** DEPOSIT GUARANTEE **0.00**

VALUATION

MARKET VALUE	PERMISSIBLE RATE	RATEABLE VALUE
F	**15 000**	**E**

AREA	ASSESSMENT RATES
616 m²	**3 432.00**

DATE	DETAILS	TARIFF	CHARGE	VAT	AMOUNT
31/10	BALANCE BROUGHT FORWARD				2 943,85
	GENERAL DEBIT/CREDIT				
31/10	PAYMENT THANK YOU				1 360,00
24/11	PAYMENT THANK YOU				1 590,00
	ASSESSMENT RATES:				
30/11	RATES RESIDENTIAL	0,018900	732,38	0,00	732,38
30/11	REBATE RESIDENTIAL	0,008500-	329,38-	0,00	329,38-
30/11	BASIC REBATE RESIDENTIAL	0,000000	117,00-	0,00	117,00-
	ELECTRICITY BASIC:				
30/11	DOMESTIC SINGLE-PHASE AMP – A1 40,00 AMP	5,994000	**A**	**B**	273,33
30/11	DOMESTIC BASIC A1	16,200000	16,20	2,27	18,47
	ELECTRICITY CONSUMPTION:				
30/11	DOMESTIC SINGLE PHASE – kWh – A1 Read Dt = 17/11/2011 Curr = 21 722 Prev = 20 952 Constant 1,0 Cons = 770,00 770,00 kWh	0,517280	398,31	55,76	454,07
	REFUSE:				
30/11	REFUSE DOMESTIC	65,970000	65,97	9,24	75,21
	SEWERAGE:				
30/11	SEWERAGE DOMESTIC	**C**	**C**	**D**	116,28
	WATER CONSUMPTION:				
30/11	W/CONSUMP DOMESTIC – 2 Read Dt = 17/11/2011 Days = 31 Curr = 1 423 Prev = 1 403 Cons = 20,00 6,20 kℓ	5,420000	33,60		
	13,80 kℓ	10,940000	150,99	25,84	210,43

90 DAYS +	60 DAYS	30 DAYS	CURRENT	VAT TOTAL	TOTAL DUE
0,00	**0,00**	**0,00**	**1 427,64**	**140,96**	**1 427,64**

FINAL DATE FOR PAYMENT
31/12/2011

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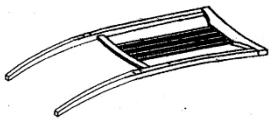
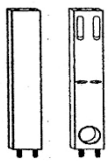
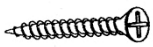
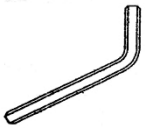
ANNEXURE B

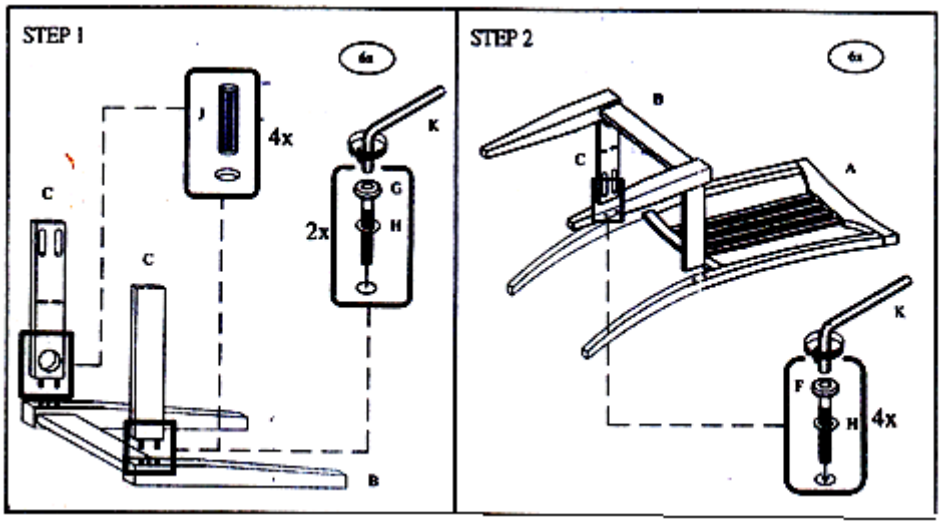
QUESTION 3

Parts for assembling a chair

FOR CHAIR x 6PCS:

A 		B		C 	
Chair Back Frame	6PCS	Front Leg Frame	6PCS	Side Rail	12PCS
D		E			
Chair Seat	6PCS	Stretcher	12PCS		
F M6 x 40mm		G M6 x 50mm		H	
JCBC Screw	24PCS	JCBC Screw	12PCS	Spring Washer	36PCS
I  M4 x 30mm		J		K 	
cb Screw	42PCS	Wood Dowel	24PCS	Allen Key	1PC

Steps to follow to assemble the chair



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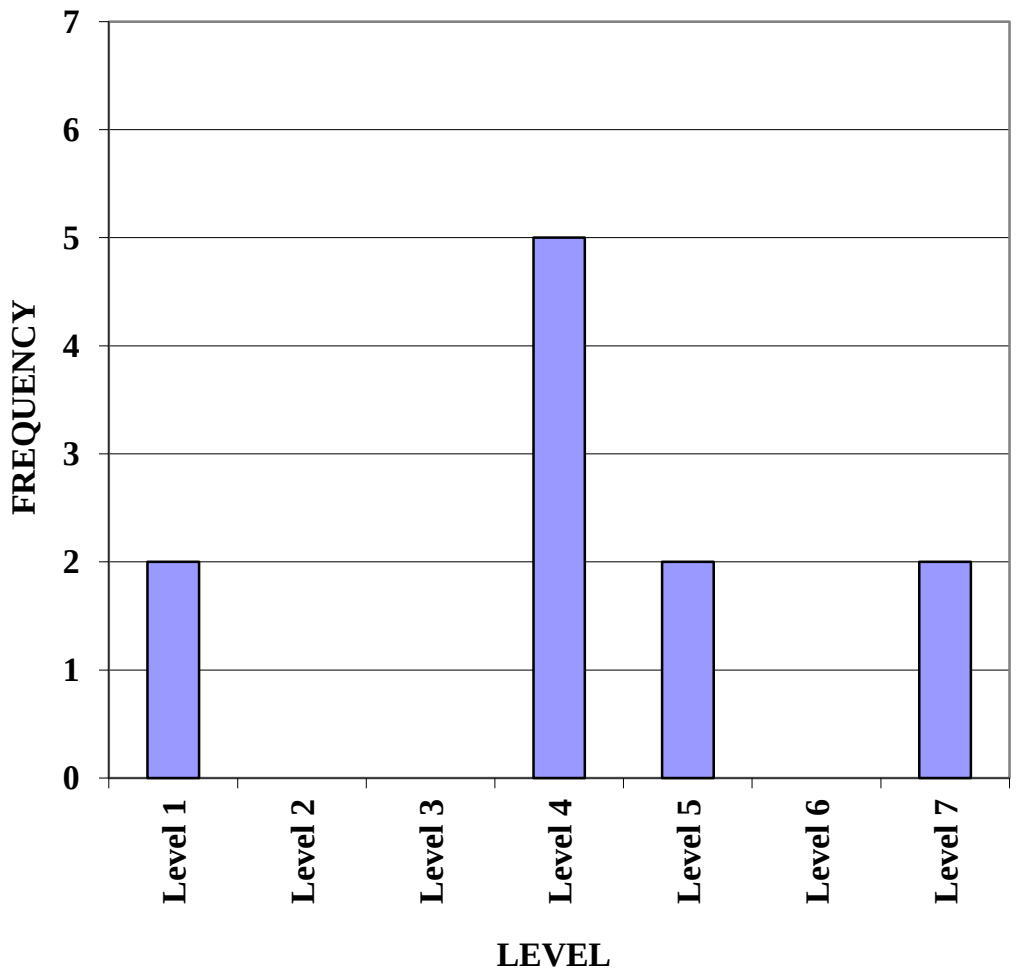
NAME:	
GRADE AND CLASS:	

ANNEXURE C

QUESTION 4.2.3

NUMBER OF LEARNERS PER LEVEL



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