Dr. Bbosa Science

UGANDA NATIONAL EXAMINATION BOARD

PRIMARY LEAVING EXAMINATION

1996 guide

MATHEMATICS

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SECTION A

1. Multiply: 0.4 x0.2

   0.4 x 0.2 = 0.08

2. Write: 21_{ten} in base two

2	21	R
2	10	1
2	5	0
2	2	1
2	1	0
2	0	1

   $\therefore 21_{ten} = 10101_{two}$

3. Find the square root of $1\frac{11}{25}$

   Change the fraction to improper fraction

   $1\frac{11}{25} = \frac{1\,x\,25+11}{25} = \frac{36}{25}$

   $\sqrt{1\frac{11}{25}} = \sqrt{\frac{36}{25}} = \frac{6}{5} = 1\frac{1}{5}$

4. Find the next number in the sequence: 0, 1, 3, 6, 10, ...

   0, 1, 3, 6, 10, 15

   +1 +2 +3 +4 +5

   ∴ the next number is 15

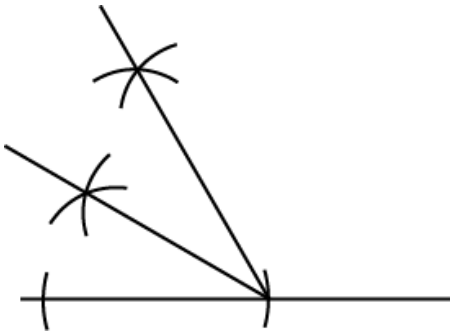
5. Divide: $^2/_3 \div {}^2/_9$

$^2/_3 \div {}^2/_9 = \frac{2}{3} \; x \frac{9}{2} = 3q$

6. Factorize completely: 4ap-2a

4ap-2a = 2a (2p -1)

7. Using a ruler and a pair of compasses only, construct an angle of 30° at P.



8. Simplify: -3- ¯3 = -3 + 3 = 0

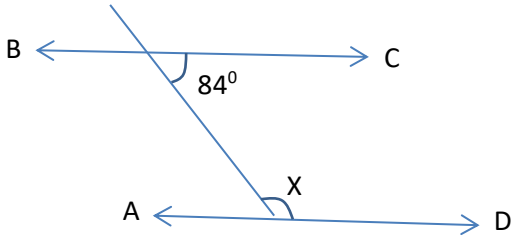
9. Majugo spends Shs. 60,000 on feeding his family. This is 75% of his monthly salary. How much is his salary?

Let the salary be x

$\frac{75}{100} of \; x = 60000$

x = 60000 x $\frac{100}{75}$ = shs 80,000

10. Find the size of the angle marked x in the figure below. BC is parallel to AD.



84 + x = 180

x = 180 – 84

= 96^0

11. Kidoko Secondary School has a students population of 688. There are 16 classes in the school. Find the average Number of students per class.

Average = $\frac{total\ population}{number\ of\ classes} = \frac{688}{16} = 43$

12. A bag contains 5 good oranges and 8 rotten oranges. If an orange is picked from the bag at random, what is the probability of picking a good orange?

Total number of oranges = 5 + 8 = 13

Probability of picking good orange = $\frac{number\ of\ good\ oranges}{total\ number\ of\ oranges} = \frac{5}{13}$

13. At a Children's clinic, the age of each child was recorded. The first seven children to arrive had their ages recorded as follows: 3, 1, 4, 5, 2, 5, 6, years. Find the median age of these children.

Rearrange in ascending order: 1, 2, 3, 4, 5, 5, 6

Median or middle number = 4

14. Find the greatest common factor of 27 and 36.

Common factors	27	36
3	9	12
3	3	4

Greatest common factor = 3 x 3 = 9

15. The time is 25 minutes past midnight. Express the time in a 24 - hour clock.

25 minutes past midnight = 0025hrs ina 24-hour clock

16. Find the complement of an angle of 70°.

Complementary angles add to 90^0

∴ the complement of $70^0 = 90^0 – 70^0 = 30^0$

17. How many prime numbers are there between 0 and 20

Prime numbers between 0 to 20 are 2, 3, 5, 7, 11, 13, 17, 19

There are 8 prime numbers between 0 and 20

18. Okia bought a radio at Shs. 20,000 and later sold it making a profit of 25%. What is his selling price?

Selling price = $(\frac{100+25)}{100}\ x\ 20{,}000 = 25000$

19. Subtract *2x* - 4 from *5x* - 4.

(5x – 4) – (*2x* – 4)

Remove brackets

= 5x – 4 – 2x +4

= 5x -2x -4 + 4

= 3x

20. Find the value of the exterior angle of a regular hexagon.

Anterior angle = $\frac{360^0}{number\ of\ sides} = \frac{360}{6} = 60^0$

21. Express 72 metres as a percentage of 6 km.

Change 6km into metres = 6 x 1000 = 6000m

Required percentage = $\frac{72\ x\ 100}{6000} = 1.2\%$

22. Solve *3p- 6*= 18 +p

3p- 6= 18 +p

Collect like terms

3p –p = 18 + 6

2p = 24

P = 12

23. The Perimeter of an equilateral triangle is 36cm. If one side is *(x +* 8) cm, find the value of x.

Equilateral triangle has all sides equal

Perimeter = 3 x one side

36 = 3(x+8)

36 = 3x + 24

3x = 12

x = 4

24. Peter waited for his brother at Entebbe Airport. He waited from 7:45 am to 12:20pm. How long did he wait?

Duration waited = 12: 20

- 07 : 45

= 4 : 35

He waited for 4hours and 35 minutes

25. The average weight of 5 boys is 48kg. When a sixth boy joins them average weight becomes 45kg. What is the weight of the sixth boy?

Total weight of 5 boys = 48 x 5 = 240 kg

Total weight of six boys = 45 x 6 = 270 kg

Weight of sixth boy = 270 – 240 = 30kg

26. Opio put Shs. 60,000 in the bank. If the interest rate was 8% per year, how much interest did he get after 6 months?

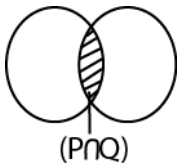
I = PRT

= 60000 x $\frac{8}{100}$ x $\frac{6}{12}$ $= shs\ 2{,}400$

27. What Arabic number is written as XCIX in the Roman system?

XCIX = 90 + 9 = 99

28. P and Q are sets. Draw a Venn diagram to represent the relationship between P∩Q.



29. Rose planted her trees in a line from point A to B. She planted orange trees and one mango tree. The mango tree was the tree was the seventh tree from either side of the line. How many trees did she plant?

ooooooooooooo o = orange trees **o** mango tree

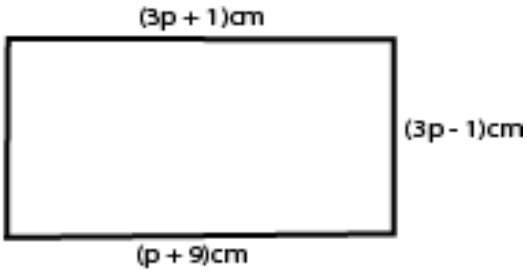
total number of trees = 13

30. Work out: 25% of 16.

25% of 16 = $\frac{25}{100}\ x\ 16 = 4$

SECTIONB

31. The figure below is that of rectangle. Use the information given to find the area of the rectangle.



Value of p	Length = 3 x 4 + 1
(3p +1) = (p + 9)	= 13 cm
Collecting like terms	Width = 3 x4 -1
3p – p = 9 -1	= 11cm
2p = 8	Area = length x width
p =4	13 x 11 = 143cm^2

32. At her birthday party, Betty received 30 guests. 11 of the guests took Pepsi-cola (P), 13 guests took Mirinda (M), 15 took Coke (C). Given that:

3 Guests took Pepsi and Mirinda only.

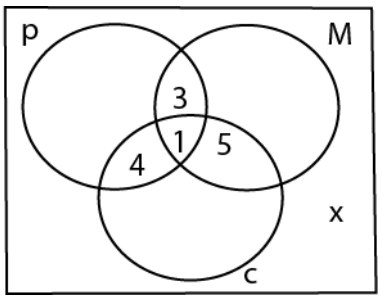
5 guests took Mirinda and Coke only.

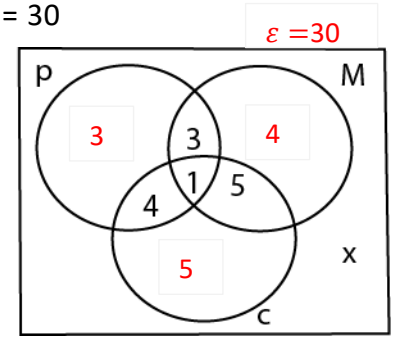
4 guests took Pepsi and Coke only

1 guest took all the three sodas

x guests did not take any of the Sodas.

(a) Complete Venn diagram below: = 30





(b) Find the number of guests who did not take any of the three sodas.

Number of students that did not take any soda

x + 3 + 3 + 4 + 4 + 4 + 1 + 5 + 5 = 30

x + 25 = 30

x = 5

(c) Find the number of guests who took only one type of soda

Number of guest who took one type of soda only = 3 + 4 + 5 = 12

33. Gateway bus travelling at 55 km per hour took 4 hours to cover part of its journey. The rest of the journey was covered in 2 hours at a speed of 40km per hour. Find the average speed of the bus over the whole journey.

Distance = speed x time

Total distance = 55 x 4 + 2 x 40

= 220 + 80

= 300

Average speed = $\frac{total\ distance}{total\ time} = \frac{300}{(4+2)} = \frac{300}{6} = 50kmh^{-1}$

34. A food factory packs a maximum of 9 identical cylindrical tins of jam in a carton. Each tin has a diameter of 7 cm and height 11cm. Find the volume of the carton.

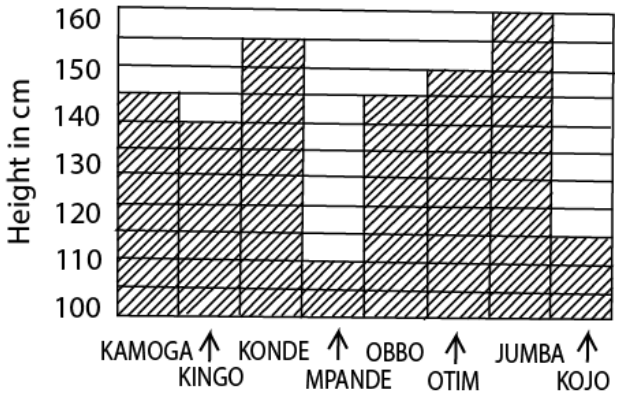
Volume of carton = 9 x volume of each cylinder

= 9 x $\pi r^2 h$

= 9 x $\frac{22}{7}\ x\ \frac{7}{2}\ x\ \frac{7}{2}\ x\ 11$

= 3811.5cm^3

35. The bar graph below shows heights in cm of 8 boys from Kelima Primary School. Use it to answer the questions that follow;



(a) Complete the table below

KAMOGA	KINGO	KONDE	MPAMDE	OBBO	OTIM	JUMBA	KOJO
145cm	140cm	155cm	**110cm**	**145cm**	**160cm**	**160cm**	**115cm**

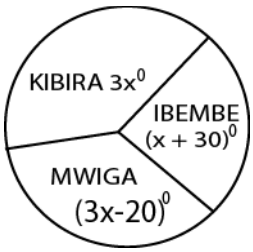
(b) What is the height of the shortest boy?

The height of the shortest boy = 110cm

(c) What does one square on the vertical axis represent? :

1square vertical axis = 5cm

36. The Pie-chart below shows the population in three villages: Kibira, Mwiga and Ibembe.



(a) Given that the population of Ibembe is 1080. Find the population of.

(i) Kibira

Value of x

$3x + (x + 30^0) + (3x – 20^0) = 360^0$

$3x + x + 3x + 30^0 - 20^0 = 360^0$

$7x = 350^0$

$x = 50^0$

Let total population be y

Angle representing Ibembe = $50 + 30 = 80^0$

The population of Ibembe = $\frac{80^0}{360^0} y = 1080$

$y = 4860$

Angle for kibira = $3 \times 50 = 150^0$

Population of Kibira = $\frac{150^0}{360^0} \times 4860 = 2025$

(ii) Mwiga

Angle for Mwiga = $3 \times 50 - 20 = 130^0$

Population of Kibira = $\frac{130^0}{360^0} \times 4860 = 1755$

34. (a) Given that $a = \frac{1}{2}; b = \frac{1}{3};\ c = \frac{1}{4}$

Find the value of b + 2c + 3a

Substitution: $\frac{1}{3} + 2 \times \frac{1}{4} + 3 \times \frac{1}{2} = \frac{4+2x3+3x6}{12} = \frac{28}{12} = \frac{7}{3} = 2\frac{1}{3}$

(b) Solve: $\frac{3x}{4} + \frac{1}{3} = \frac{7}{12}$

Multiply by 12 both sides

3x x 3 + 4 = 7

9x = 3

x = $\frac{1}{3}$

38. Okia bought a car at Shs. 5,000,000. He sold it to Chondo, making a loss of 20%, Chondo sold the same car to Magino making a loss of 5%. How much money did Magino pay for the car?

Cost of the car to Chondo = $\frac{100-20}{100}\ x\ 5{,}000{,}000 = 4{,}000{,}000$

Cost of the car to Magina = $\frac{100-5}{100}\ x\ 4{,}000{,}000 = 3{,}800{,}000$

39. A tank has two taps that pour water into it. Tap A turned alone, fills the tank in 20 minutes. Tap B turned on alone fills the tank in 10 minutes.

(a) How long will the two taps turned on at the same time take to fill the tank?

Time taken = $\frac{product}{sum} = \frac{20\ x\ 10}{20+10} = \frac{200}{30} = 6\frac{2}{3}\ minutes$

(b) If both taps pour 36 litres of water per minute, what amount of water does the tank hold when full?

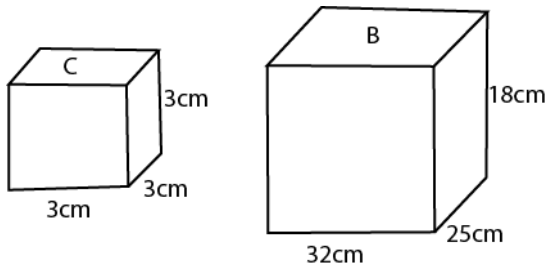
1min = 36litres

$6\frac{2}{3}\ minutes$ = 36 x $6\frac{2}{3}$ = 240 litres

40. The table below shows Anne's shopping bill. Fill in the blanks in the table.

Item	Quantity	Price	Cost
Tomatoes	5kg	Shs. 450 per kg	Shs. **2,250**
Beans	4kg	**450**per kg	Shs 1800
Omo soap	**6** packets	Shs 350 per pkt	Shs 2100
Cooking oil	4litres	Shs 800 per litre	Shs **3200**

39.Below is a cube (C) and a box (B). Waiswa packs curry powder in cubes and packs the cubes in a box for export to Kigali.



Calculate space left empty after filling the box with cubes of curry powder.

Number of boxes along the length = $\frac{32}{3} = 10\frac{2}{3}$

Number of boxes along the width = $\frac{25}{3} = 8\frac{1}{3}$

Number of layer = $\frac{18}{3} = 6$

Number of cubes that are packed in the box = 10 x 8 x 6 = 480 cubes

Volume occupied by the cube = 480 x 3 x 3 x3 = 12960 cm^3

Volume of the box = 32 x 25 x 18 = 14400cm^3

Unoccupied space = 14400 – 12960 = 1440cm^3

40.The diagonals of a parallelogram bisect each other. Using a pair of compasses and a ruler, construct a parallelogram PQRT, given that PQ=7cm, PR=10cm and QT=8cm. Measure QR.

(a) Draw a horizontal line PQ = 7 cm
(b) Place the compass at P and draw arc on the side of Q 10 cm away from P
(c) Place the compass at Q and draw an arc in space on the side of P away from Q.
(d) Place the ruler horizontally between the two arcs and measure 7cm to determine point T and R