08/08/2023

NTUNGAMO DISTRICT MOCK EXAMINATION 2023.

PRIMARY SEVEN

MATHEMATICS

Time Allowed: 2 hours 30Minutes

Index No.	Random No.						Personal No.	

Candidate's Name: ..... TR's GUIDE .....

Candidate's Signature: .....

READ THE FOLLOWING INSTRUCTIONS CAREFULLY:

1. This paper has two sections: A and B.
2. Section A has 20 questions ***(40marks).***
3. Section B has 12 questions ***(60marks).***
4. Attempt **ALL** questions in both sections. All answer to both sections A and B must be written in the spaces provided.
5. **All answers must be written in blue or black ball point pens or ink.** Only diagrams and graph work must be done in pencil.
6. Unnecessary **alteration** of work will lead to loss of marks.
7. Any ***handwriting*** that cannot be easily read may lead to loss of marks.
8. Do not fill anything in the table indicated "For Examiners' Use Only."

FOR EXAMINER'S USE ONLY		
QN. No.	MARK	SIGN
1 – 10		
11 – 20		
21 – 30		
31 – 32		
TOTAL		

Turn ove

SECTION A: (40marks)

1. **Workout:** 49 + 13

$$\begin{array}{r} 49 \\ +13 \\ \hline 62 \end{array}$$

2. Simplify: 7 - 11

$$-7-(-11)$$
$$=-7+11$$
$$=4$$

3. Write CLXIV in Hindu Arabic numerals.

C LX IV
100 + 60 + 4 = 164

4. Find the next number in the sequence.

2, 4, 7, 12, 19, 30
+2 +3 +5 +7 +11

5. Solve the equation.
3m – 2 = 19

$3m - 2 = 19$
$3m - 2 + 2 = 19 + 2$
$\frac{3m}{3} = \frac{21}{3}$
$m = 7$

6. Change 13_{ten} to binary base.

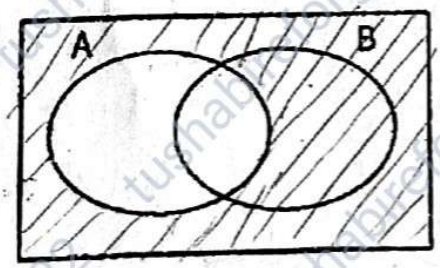
2	13	r
2	6	1
2	3	0
	1	1

$= 1101_{two}$

7. A die is tossed once. What is the probability that a number ~~is~~ greater than 4 will appear on top?

A die = 1, 2, 3, 4, 5, 6
Greater than 4 = 5, 6
$P = \frac{P.C}{T.C}$
$P = \frac{2}{6}$

8. Shade A^1 in the Venn diagram below.



9. A car moved at a speed of **48**km/hr for **20**minutes. What distance did it cover?

$D = S \times T$

$D = \frac{48}{1}\text{km/hr} \times \frac{20}{60}\text{hr}$

$D = 16\text{km}$

$D = 16\text{km}$.

10. The mean of **3, 4, t, 5** and **6** is **5**. What is the value of **t**?

$\frac{3+4+t+5+6}{5} = 5$

$\frac{18+t}{5} \times 5 = 5 \times 5$

$18 + t = 25$

$t = 25 - 18$

$t = 7$.

11. Round off 54.361 to the nearest tenth.

T.O	TH	H	TTH
54.	3	6	1
	0.	1	d
54.	4		

$\therefore 54.361 \approx 54.4$

12. Convert $10m^2$ to cm^2

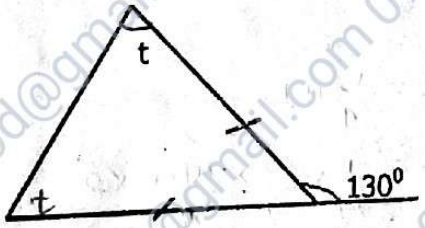
$1m = 100cm$.

$1m^2 = (100 \times 100)cm^2$

$10m^2 = (100 \times 100) \times 10cm^2$

$= 100000cm^2$.

13. Find the value of **t** in degrees.



$t + t = 130°$

$2t = 130°$

$\frac{2t}{2} = \frac{130}{2}$

$t = 65°$.

14. What is the complement angle of $(y - 20)^0$?

$90 - (y - 20)°$

$90° - y + 20°$

$90° + 20° - y$

$(110° - y)°$

15. Four boys can build a kraal in **12** days. How many more boys are needed to do the same work in **8** days?

12 days need 4 boys

1 day needs (4×12) boys.

8 days need $\frac{(4 \times 12)}{8_2}$ boys^2

$= 6$ boys

More boys $= 6$ boys $- 4$ boys

$= 2$ boys.

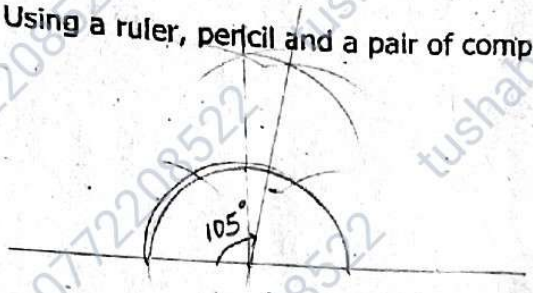
16. A trader sold a shirt at sh. 45,000 and made a loss of sh. 7000. How much did he buy the shirt?

B.P = S.P + Loss

= Sh. 45000 + Sh. 7000

= Sh. 52000.

17. Using a ruler, pencil and a pair of compasses only, construct an angle of 105^0.



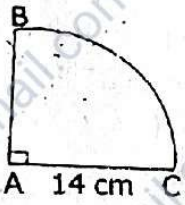
18. Use distributive property to work out (65 ÷ 4) + (35 ÷ 4).

$(65+35) \div 4$

$= 100 \div 4$

$= 25.$

19. Find the length of the arc **BC** in the diagram below.
Use $\pi = \frac{22}{7}$



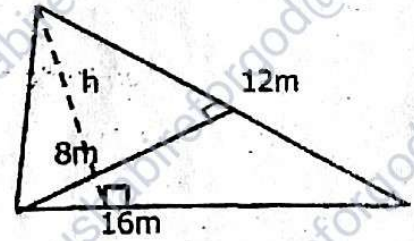
$C = \frac{1}{4}\pi D$

$C = \frac{1}{4} \times \frac{22}{7} \times 14\text{cm} \times 2$

$C = 11\text{cm} \times 2$

Length of arc BC = 22cm.

20. In the figure below, find the length marked h.



Area = Area.

$\frac{1}{2} \times b \times h = \frac{1}{2} \times b \times h$

$\frac{1}{2} \times 16\text{m} \times h = \frac{1}{2} \times 12\text{m} \times 8\text{m}$

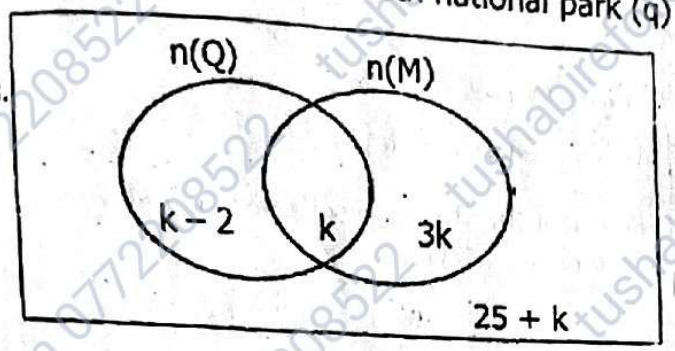
$8mh = 48m^2$

$\frac{8mh}{8m} = \frac{48m^2}{8m}$

$h = 6m.$

SECTION B: (60marks0

21. The Venn diagram below shows the number of tourists who visited Murchson falls national park (M) and Queen Elizabeth national park (q) parks.



(a) If 30 tourists visited neither Marchson falls nor Queen Elizabeth National

Find the value of k. ***(2marks)***

$25 + k = 30$

$25 - 25 + k = 30 - 25$

$k = 5.$

b) Find the total number of tourists who visited.

(i) Murchson falls national park. ***(2marks)***

$n(M) = k + 3k$ | $n(M) = 20$ tourists

$n(M) = 5 + 3 \times 5$

$n(M) = 5 + 15$

(ii) Queen Elizabeth national park. ***(1mark)***

$n(Q) = k - 2 + k$

$n(Q) = 5 - 2 + 5$

$n(Q) = 3 + 5$

$n(Q) = 8$ tourists

22. The bill table below shows Juma's shopping at the beginning of term two 207

a) Complete it correctly. ***(5marks)***

Item	Quantity	Unit cost	Amount
Pens	4	Sh. 600	Sh. 2400
Rulers	8	Sh. 1000	Sh. 8000
Books	10	Sh. 2500	Sh. 25000
Pencils	20	Sh. 200	Sh. 4000
Total amount			**Sh. 39400.**

Pens = 600 × 4 = 2400

Rulers = 8000 / 1000 = 8.

Books = 25000 / 10 = Sh. 2500

Pencils = 4000 / 200 = 20.

Total = 2400 + 8000 + 25000 + 4000 = 39400

b) If Juma was given a discount of 10%, calculate amount of money he paid. ***(1mark)***

100% - 10% = 90%

$\frac{90}{100} \times 39400 = 35460$

23. Three bells are used in a Primary School, one for lower primary is rung after every **30**minutes, for middle primary is rung after **40**minutes and for upper classes is rung After **50**minutes.

a) At what time will the bells be rung together again. ***(4marks)***

2	30	40	50
2	15	20	25
2	15	10	25
3	15	5	25

5	5	5	25
5	1	1	5
1	1	1	1

Lcm = 2x2x2x3x5x5

Lcm = 2x25

Lcm = 600 minutes

They will be rung together again after 600 minutes

b) How many lessons will have been taught in the middle primary? ***(1mark)***

Middle primary = $\frac{600}{40}$

= 15 lessons.

24. The mean of **9**, **7**, (2k + 5) and **10** is **8**.

a) Find the value of k. ***(3marks)***

$\frac{9+7+2k+5+10}{4} = 8$

$\frac{31+2k}{4} = 8$

$4 \times \frac{31+2k}{4} = 8 \times 4$

$31 + 2k = 32$

$2k = 32 - 31$

$\frac{2k}{2} = \frac{1}{2}$

$k = \frac{1}{2}$.

b) Find the median. ***(2marks)***

Arrange in ascending.

(2k+5), 7, 9, 10

6, 7, 9, 10

$= \frac{7+9}{2}$

$= \frac{16}{2}$

$= 8$.

25. The length of one side of a Rhombus is 15cm.

a) Calculate the length of the shortest diagonal, if the other diagonal is 24cm. ***(3marks)***

$a^2 + 12^2 = 15^2$

$a^2 + 144 = 225$

$a^2 = 225 - 144$

$a^2 = 81$

$\sqrt{a^2} = \sqrt{81}$

$a = 9$

∴ Shortest diagonal

= 9cm + 9cm

= 18cm.

b) Calculate the area of the Rhombus. ***(2marks)***

$A = \frac{1}{2} \times d_1 \times d_2$

$A = \frac{1}{2} \times 18cm \times 24cm$

$A = 216cm^2$.

26. Given that **y = 2x + 1**. Complete the table below. ***(5marks)***

X	2	4	-1	-3	0
Y	5	9	-1	-5	1

$Y = 2x + 1$

$Y = (2 \times 2) + 1$

$Y = 4 + 1$

$Y = 5$

$y = 2x + 1$

$9 = 2x + 1$

$\frac{9-1}{2} = \frac{2x}{2}$

$\frac{8}{2} = x$

$4 = x$

$y = 2x + 1$

$y = (2x - 1) + 1$

$y = -2 + 1$

$y = -1$.

$y = 2x + 1$

$-5 = 2x + 1$

$-5 - 1 = 2x$

$\frac{-6}{2} = \frac{2x}{2}$

$-3 = x$

$y = 2x + 1$

$y = (2 \times 0) + 1$

$y = 0 + 1$

$y = 1$.

27. A father is **25** years older than his daughter. In ten years time, the father will be twice a old as his daughter.

a) How old is the father now? ***(3marks)***

	father	daughter
now	$x+25$	x
In 10yrs	$x+35$	$x+10$

$(x+10)2 = x+35$

$2x+20 = x+35$

$2x-x = 35-20$

$x = 15$

father now; $x+25$

$=15+25$

$= 40$ years.

b) Express the age of the daughter as a percentage of her father's age now. ***(2marks)***

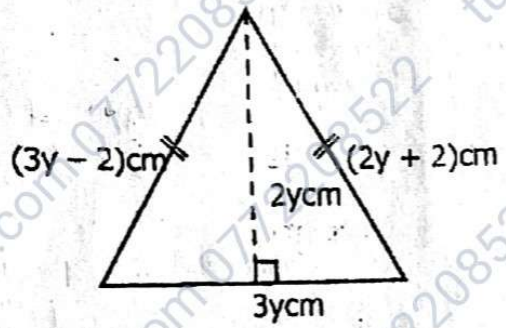
Daughter = 15yrs

father = 40yrs

$\%age = \frac{15}{40} \times 100\%$

$= \frac{75}{2} = 37\frac{1}{2}\%$

28. The figure ABC below is an Isosceles triangle. Use it to answer the questions that follow.



a) Find the value of y. ***(2marks)***

$3y-2 = 2y+2$

$3y-2y = 2+2$

$y = 4$

b) Find the area of the triangle ABC. ***(3marks)***

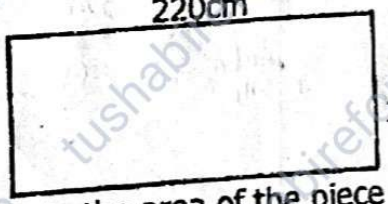
$A = \frac{1}{2}bh$

$A = \frac{1}{2} \times (3\times4)cm \times (2\times4)cm$

$A = \frac{1}{2} \times 12cm \times 8cm$

$A = 48cm^2$

29. A piece of metal below was folded to form a cylindrical container. Use it to answer the following questions.



a) Calculate the area of the piece of metal above. ***(2marks)***

$A = L \times W$

$A = 220cm \times 100cm$

$A = 22000cm^2$

b) Workout the volume of the cylindrical container formed. (Use $\pi = \frac{22}{7}$) *(3marks)*

$C = 2\pi r$

$220cm = 2 \times \frac{22}{7} r$

$220cm = \frac{44r}{7} \times 7$

$\frac{7 \times 220cm}{44} = \frac{44r}{44}$

$35cm = r$

$V = \pi r^2 h$

$V = \frac{22}{7} \times 35cm \times 35cm \times 100cm$

$V = 110cm \times 3500cm^2$

$V = 385,000 cm^3$

10. a) The interior angle of a regular polygon is four times its exterior angle. Find the size of the exterior angle of the polygon. *(2marks)*

Let the ext. $\angle$ be n

$4n + n = 180°$

$\frac{5n}{5} = \frac{180°}{5}$

$n = 36°$

$\therefore$ ext. $\angle = 36°$

b) Find its interior angle sum. *(3marks)*

Int. $\angle$ sum $= (2n - 4)\ 90°$

No. of sides $= \frac{360°}{\text{ext}\angle}$

$= \frac{360°}{36°}$

$= 10$ sides.

$= (2 \times 10) - 4 \times 90°$

$= (20 - 4) \times 90$

$= 16 \times 90$

$= 1440°$

31. Three taps **X**, **Y**, and **Z** are connected to a tank. Tap **X** can fill the tank in **8** minutes, tap **Y** can fill the same tank in **10** minutes while tap **z** empties the tank in **20** minutes. How long will all the taps take to fill the tank, if they are all open at the same time?

In 1 min X fills $\frac{1}{8}$ of a tank.

" " Y fills $\frac{1}{10}$ of a tank

In 1 min Z empties $\frac{1}{20}$ of a tank

In 1 min all taps operation $= \left(\frac{1}{8} + \frac{1}{10}\right) - \frac{1}{20}$

$\left(\frac{10+8}{80}\right) - \frac{1}{20}$

$\frac{9}{40} - \frac{1}{20} = \frac{9-2}{40} = \frac{1}{16}$

Time taken $= 1 \div \frac{1}{40}$

$= 1 \times \frac{40}{1}$

$= 40$ minutes.

$= 5\frac{5}{7}$ minutes *(4marks)*

32. An aeroplane flew from Nairobi on a bearing of 120^0 to Juba for a distance of 500km. Then the aeroplane left Juba on a bearing of 240^0 to Lagos for a distance of 800km.

a) Using a scale of 1cm to 100km, draw an accurate diagram to show the route of the Aeroplane. *(4marks)*

Sketch.

1cm = 100km.

$500km = \frac{500}{100} = 5cm.$

$800km = \frac{800}{100} = 8cm$

$240 - 180 = 60°$

b) Find the shortest distance between Nairobi and Lagos. *(1mark)*

Shortest distance between Nairobi & Lagos = 7cm.

END