456/2
MATHEMATICS
Paper one
JAN./FEB.2021

2 ½ hours

KAMSSA JOINT MOCK EXAMINATIONS

Uganda Certificate of Education

MATHEMATICS

Paper Two

2 ½ HOURS

INSTRUCTIONS

- *Answer all questions in section A and any **five** from section B,*
- *Any additional questions answered will not be marked.*
- *All necessary calculations must be done on the same page as the rest of the answers.*
- *Only silent non – programmable scientific calculators may be used.*

SECTION A (40 Marks)

1. Find the lowest common multiple (L.C.M) of 20x, 100 and $5x^2$.

2. Given that vector PQ = $\begin{pmatrix} 4 \\ 8 \end{pmatrix}$ and P = $\begin{pmatrix} 1 \\ 4 \end{pmatrix}$, find the magnitude of vector Q

3. Find the equation of a line through (-3, 5) and parallel to $x - 3y + 2 = 0$

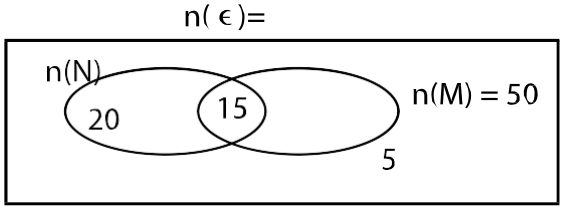
4. Given that $g(x) = ax^2 - 7$ and $g(2) = 5$.
   Find: (i) value of a (ii) $g(^2/3)$.

5. Given that y is inversely proportional to x^2. Copy and complete the table

x	-	2	5
y	80	5	-

6. An area of about $0.48km^2$ on ground is represented as $12cm^2$ on a map. Determine the scale of a map.

7. Use the Venn diagram to answer the questions below.



Find
(i) $n(N^1 \cap M)$

(ii) $n(\epsilon)$ whose ϵ is the universal

8. Tom's account had Shs. 396,750 after 2 years in Centenary Bank which offered 15% compound interest rate per annum. Determine his first deposit (principle)

9. Evaluate : ½ Log 25 + log60 - $^1/_3$ log 27 without using tables or calculator.

10. A box of length 20 cm has width 12cm and volume $3600\ cm^2$. Find it's
    (i) height
    (ii) Total surface Area

SECTION B (60 Marks)

11 (a) Without using mathematics tables or calculator

Evaluate $\left[\frac{1}{64}\right]^{1/3} \times \left[\frac{81}{16}\right]^{-3/4}$ **(6 marks)**

(b) Prime factorise 360 hence find the value of log360 using log2 = 0.3010 log3 = 0.4771 log 5=0.6990. **(6 marks)**

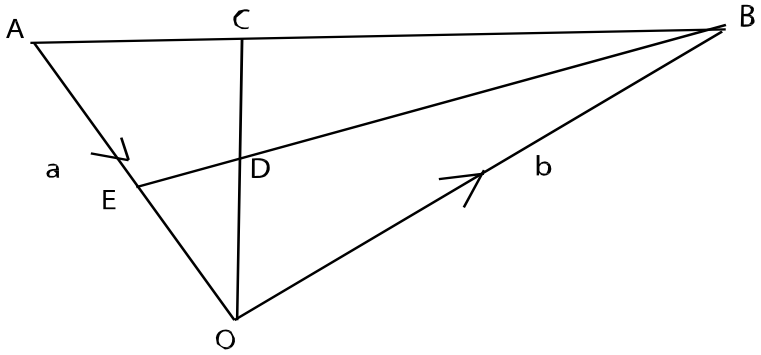
12. Below is an Advertisement for Walugembe and Sons Computer accessories Uganda Ltd.

NEW	**NEW**	**NEW**
	L A P T O P S	
CASH PRICE:	1.2Millions Less 5% Cash discount	
HIRE PURCHASE	Deposit 60% of 1.2 millions then pay 150,000/= per month for 4 months	

Hellen and Amos each bought 1 laptop. Hellen paid cash while Amos opted for hire purchase. Determine how much more money Amos paid than Hellen.

(12 marks)

13. In the figure below AO = a OB = b, C divides AB is the ratio 1:2, D divides OC in the ratio 3:2



(a) Find vector BA, AC and BD in terms of a and b.

(b) Show that the points E, D and B are collinear if E is the mid point of OA. Find also the BD:DE **.(12 marks)**

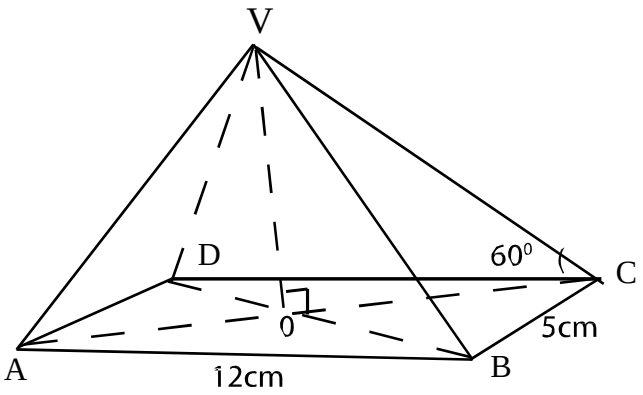
14. In a farming project, there are 50 farmers 18 grow cassava, 17 grow banana, 24 grow potatoes, 5 grow potatoes and cassava 7 grow potatoes and banana, 6 grow cassava and banana. Only two grow all the three cash crops. **(12marks)**

(i) Represent this information on a Venn diagram.

(ii) How many farmers don't grow any of these cash crops

(iii) Find the probability that a farmer selected at random grows only one cash crop.

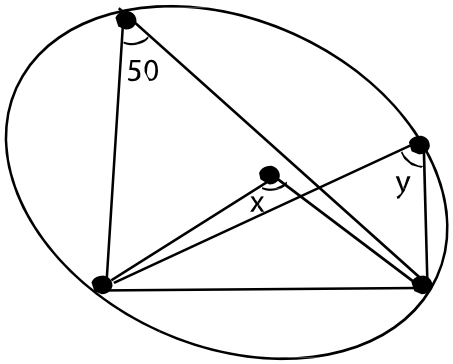
15. Below is a pyramid on a rectangular base ABCD. AB =12cm, BC = 5cm and angle VCO = 60^0 where V is the vertex and O is the centre of the base.



Calculate the
(i) Length AC
(ii) Vertical height VO
(iii) Angle between planes BVC and AVD at V.
(iv) Volume of the pyramid. **(12 marks)**

16. In a certain school, a teacher's allowance (A) varies as a constant (K) and partly varies as the number of responsibilities (R) given. A teacher with 7 responsibilities earns Shs. 240,000 while another with 4 responsibilities earns Shs. 180,000/=. Find
(i) The constant amount earned by each teacher
(ii) Write down an equation connecting A and R. Hence find the amount earned by a teacher with 5 responsibilities. **(12 marks)**

17. In the figure below, O is the case of the circle. Find angle x and y.



(4 marks)

(b) A semi - circle has an area of $308m^2$. Find the radius of this circle and it's perimeter use $\Pi = \frac{22}{7}$ **(04 marks)**

(c) Given that g(x) = x-3 and f (x) = $\frac{1}{2x}$ find

fg(1)

END **(04 marks)**