456/2

MATHEMATICS

Paper ***Two***

July / August 2023

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.*

© 2023 Kampala Integrated Secondary Schools' Examinations Bureau

SECTION A (40 marks)

1. Find the **LCM** and **HCF** of 30 and 42.

2. Find the equation of a line that cuts y-axis at 5 and parallel to line joining A(4,7) and B(10,15).
3. Express $\sqrt{20} + \sqrt{125} - \sqrt{45}$ in form of $a\sqrt{b}$

4. Given that $f(x) = \frac{2x+a}{5-x}$ and that f(-1) = 2. Find the value of a.

5. Twenty men working 5 hours can offload a train in 3 days. Find how many men working 4 hours can offload the train in 5days.

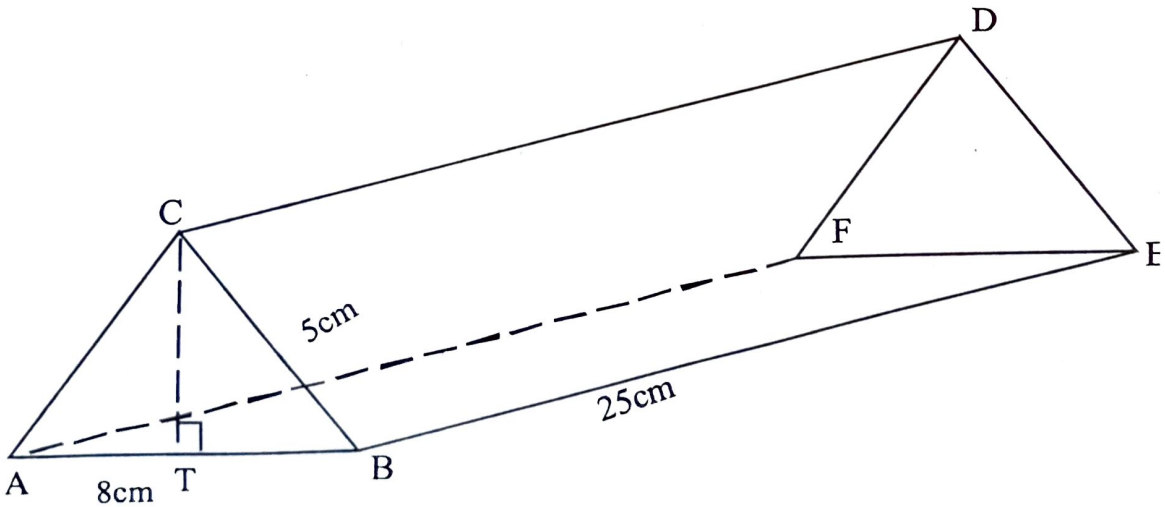
6. Use prime factor method to find the square root of 3.24.

7. A train takes 15 minutes less for a journey of 156km if its speed is increased by 4kmh^{-1} from its normal speed (V). find the normal speed V.

8. Given that P = 2a+b-3c and a = $\begin{pmatrix}2\\1\end{pmatrix}$, $b = \begin{pmatrix}4\\5\end{pmatrix}$, $c = \begin{pmatrix}3\\2\end{pmatrix}$. Find;
   (i) P (ii) |**P**| to 3 significant figures.

9. John bought a techno phone bought at shs 35,000, depreciating at a rate of 20% per annum. Musa bought it after $1\frac{1}{2}$years from John at Shs 4000 less its value then. Find how much money Musa paid.

10.



In the prism ABCDEF, AB=8cm, CB=5cm, BE=25cm and CT is the height of the cross-section figure ABC. Find the volume of the prism.

SECTION B (60 marks)

Attempt not more than five questions from this section.

11.a) Given that $f(x) = nx^2 - 15$, $f(2) = 65$.

i) Find the value of n

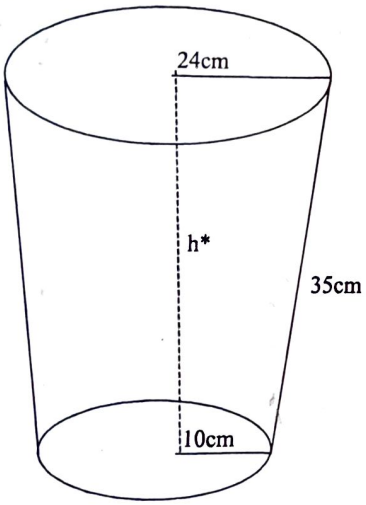
ii) Find $f^{-1}(x)$ and $f^{-1}(85)$

b) If $g(x) = \frac{x-4}{x^2-25}$ find the value(s) of x for which;

i) $g(x) = 0$

ii) g(x) is not defined.

12. Below is a tin in form of a frustrum of radii 24cm and 10cm. it's slanting sides measure 35cm.



calculate the;

a) Height h* of a frustrum

b) Volume of the frustrum

13. Towns P and Q are 450km apart. At 7:30am, a lorry starts from Q towards town P at an average speed of $100kmh^{-1}$ nonstop while a coaster starts from town P an hour after the lorry had gone moving at an average speed of $60kmh^{-1}$. At 10:00am the lorry broke down for 30 minutes and then continued after at a reduced speed of $50kmh^{-1}$ until it reaches.

a) Draw on the same axes, the distance time graph showing the journeys of the lory and the coaster.

b) State the time of arrival of the two vehicles at their destination.

c) Determine when and what distance from town Q the vehicles met.

d) Find the average speed of the lorry.

14a) Given that y varies jointly as x^2 and inversely as $\sqrt{z}$. When $y=225$, $x=3$ and $z=16$.

i) Write down an equation connecting y, x, and z.

ii) Find the possible values of x when $y=80$ and $z=25$.

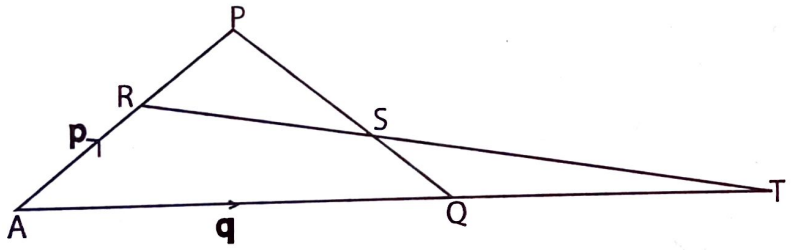
b) Nnalongo shared money to her children in the ratio 4:5:3 to Jovan, Jovia and Jonah. If Jovan got shs 320,000.

i) How much did Nnalongo have?

ii) How much more money did Jovia get than Jonah?

15. In a given science-oriented school, it was found out that, of the 108 students in S.5. The number of students who offer none of Biology (B) Chemistry (C) and Physics (P) is equal to those offering all the three subjects.
Given that 50 offer Biology,
60 offer Chemistry and 45 offer physics,
12 students offer only Biology and physics,
15 students offer Biology and chemistry,
24 students offer Chemistry and Physics.
a) Represent the information in a venn diagram.
b) How many students offered Biology and physics.
d) What is the probability of picking students who offered at least two subjects.
c) Find the number of students who offered PCB.

16. In the figure below AP=**p**, AQ=**q**, 2AP=5AR and 4PQ=5PS. When RS and AQ are produced, they meet at T.



a) Express in terms of **p** and **q** the vectors.
i) AR ii) AS iii) RS
b) Given that AT=nAQ and RT=mRS, find the vectors of m and n.

17a). The price of Otim's car was increased by 10% to shs 8800,000.
i) What was the original price.
ii) If Opio bought this car at this increased price and sold it a year later at 20% discount . Express Opio's selling price as a percentage of original price.

b) Mariam's taxable income is shs 750,00. She earns a tax-free allowance of shs 150,000 and pays a tax of shs 125,000. Calculate her net income.

END