

456/2

MATHEMATICS

Paper 2

April.2018

2½HOURS

END OF TERM ONE EXAMINATION

S.4 MATHEMATICS PAPER 2

INSTRUCTIONS

- Answer all questions in Section A and **NOT** more than five questions from Section B
- All necessary working must be clearly shown
- Non – programmable calculators may be used
- Write your name on each answer sheet used
- Don't put your question paper on answer sheets
- Recopy the table below on the first page of your answer sheets

FOR EXAMINERS USE ONLY

SECTION A	11	12	13	14	15	16	17	TOTAL

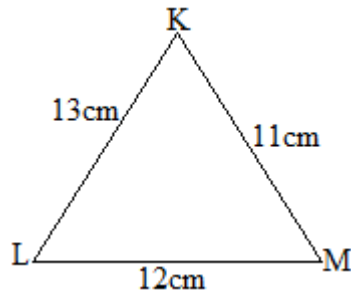
SECTION A (40 MARKS)

Answer all questions in this Section

- Express 3375 as a product of its prime factors hence find the cube root of 3375. (4mks)
- Given that sets; $A = \{\text{all factors of } 12\}$ and $B = \{\text{multiples of three less than } 20\}$
 - List the members of sets A and B (2mks)
 - Find $\cap (A \cap B)$ (2mks)
- Given that $g(x) = 3x + n$ and $g(4) = 7$ find the value of
 - n (2mks)
 - $g(2)$ (2mks)
- P** is inversely proportional to **Q**, given that when **P** = 25, when **Q** = 8.
Find the value of **P** given that **Q** = 20 (4mks)
- Hellen bought one dozen of shirts at Shs 40,000 per shirt. She sold them at a profit of 20%. How much money did she earn as profit from the shirt sales? (4mks)
- Given that $AB = \begin{pmatrix} 3 \\ 4 \end{pmatrix}$, $BC = \begin{pmatrix} 4 \\ -8 \end{pmatrix}$ and $BD = \frac{1}{2}BC$ Find
 - AD
 - $|AD|$ (4mks)
- Convert the;
 - 23 05 hours into 12 hour clock. (2mks)
 - 01:05pm into 24 hour clock (2mks)
- An examination body pays its setters shs100, 000 as a basic fee and shs 8000 for each question set. A withholding tax of 6% is deducted from a setter's gross pay. Mr. Nakabaale set ten questions. How much was his net pay? (4mks)
- The coordinates of points A and B are (-4, -5) and (x, y) respectively. The coordinates of the midpoint of \overline{AB} are (-3, 1). Determine the values of x and y (4mks)

10. Find the area of triangle KLM in the figure below. K

(4mks)



SECTION B (60Marks)

Attempt any five questions from this section. All questions carry equal marks.

11. A group of 84 tourists were asked whether they had visited Gulu, Mbarara or Soroti. The number of tourists who had visited Gulu was equal to the number of tourists who had visited Mbarara. 54 had visited Soroti. 14 had visited Soroti and Gulu only. 12 had visited Soroti and Mbarara only 16 had visited Gulu and Mbarara only. 13 had visited all the three towns. 8 had not visited any of the towns

- Represent the given information on a Venn diagram. (5mks)
- How many tourists had;
 - Visited Mbarara? (4mks)
 - Not visited Gulu?
- Given that a tourist is selected at random, what is the probability that the tourist had visited two towns only? (03mks)

12. Find:

- Equation of line M passing through the points $(1,0)$ and $(3,0)$. (4mks)
- Equation of line N which is perpendicular to line M above and passing through point $(-2,4)$. (4mks)
- The coordinates of the point of intersection of lines M and N above. (4mks)

13. Given that a is partly constant and partly varies directly as the square of b and that $a = 82$ when $b = 5$ and $a = 19$ when $b = 2$.

- Form an equation relating a and b . (8mks)
- Find a when $b = 4$. (4mks)

- Given the mapping is defined by $f(x) = x^2 - x + 3$. Determine the range of the mapping whose domain is $\{-3, 0, 1, 2\}$ (5mks)
- If $g(x) = 3x - 5$ and $f(x) = x^2$, find the $gf(x)$ hence $gf(-2)$. (3mks)
- Given that $h(x) = 2x + 5$, find the $h^{-1}(11)$. (4mks)

15. Given that $OP = \begin{pmatrix} 3 \\ 4 \end{pmatrix}$, $PQ = \begin{pmatrix} 4 \\ -8 \end{pmatrix}$, $OR = \frac{1}{2}OQ$ and S is a point on \overline{PQ} , such that $\overline{PS} : \overline{SQ} = 1 : 3$, Find:

- OR (4mks)
- PR (4mks)
 - $|\overline{PR}|$
- OS (4mks)

16. The tax structure of a certain country is as shown below

Taxable income	Rate %
01 – 100,000	5
100,001 – 200,000	13
200,001 – 300,000	20
300,001 – 400,000	30
400,001 – 500,000	40
500,001 – 600,000	45
600,001 and above	60

Mr. Mushabe earns a gross salary of shs 995,000 per month. This include the following allowances

Homing allowance	960,000/= per annum
Water and electricity	300,000/= per annum
Insurance	15,000/= per month
Medical	30,000/= per month
Transport	2,000/= per day
Marriage	10,000/= per month

Children allowance up to only 3 children

Age bracket (year)	Amount (shs)
0 – 9	25,000/=
10 – 17	15,000/=
18 and above	5, 000/=

Given that Mr. Mushabe is married with children who are aged 3, 7, 14 and 19 years. (Month =30 days and year =360day)

Using the tax structure above. Calculate;

- Mr. Mushabe taxable income.
- The income tax Mr. Mushabe pays.
- The percentage of Mr. Mushabe gross salary which is paid as tax, correct your answer to one decimal place. (12mks)÷

17.a) without using calculator Simplify; $\frac{\left(3\frac{5}{6} \div 2\frac{2}{15}\right) \times \frac{3}{23}}{5\frac{1}{3} - 2\frac{7}{12}}$ (06mks)

b) A forest reserve covering an area of 807.5km^2 is represented on a map by a green area of 32.3cm^2 . determine the scale of the map (06mks)

END