456/1

MATHEMATICS

PAPER 1

JULY/AUGUST 2019

2½ HOURS

KAYUNGA SECONDARY SCHOOLS HEADTEACHERS AND PRINCIPALS ASSOCIATION (KASSHPA)

Uganda Certificate of Education

Mock Exams 2019

MATHEMATICS

PAPER 1

2 HOURS: 30 MINUTES

INSTRUCTIONS TO CANDIDATES

Answer **all** *questions in Section* **A** *and any* **five** *from Section* **B**

Any additional question(s) answered will **not** *be marked.*

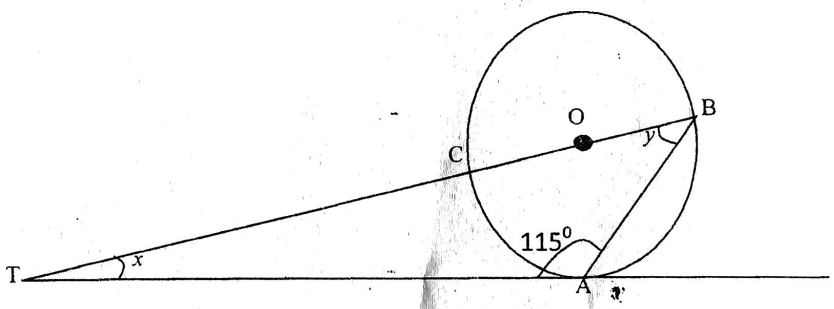
All *necessary calculations must be done in the answer booklet provided. Therefore, no paper should be given for rough work.*

Squared paper is provided.

Silent, non-programmable scientific calculators and mathematical tables with a list of formulae maybe used.

SECTION A: (4 Marks each)

1. Evaluate $\frac{8\frac{2}{5}-3\frac{2}{3}+1\frac{5}{6}}{1\frac{1}{5}+1\frac{1}{2}\times1\frac{1}{3}}$
2. Simplify $\frac{18^2\times6^3}{12^3}$, without using tables or calculator and leave your answer in power form.
3. Given that $\log_{10} x = \bar{2}.0671$ and $\log_{10} y = 0.7743$, without using tables or calculator evaluate; $\log_{10}\left(\frac{y}{x^2}\right)$
4. Given that $X \wedge Y = Y - \sqrt{XY}$. Evaluate $5 \wedge (25 \wedge 10)$.
5. Make V the subject of the formula $X = \frac{R(E-V)}{V}$.
6. Find the value of the base n if $32_n - 21_{five} = 24_n$
7. In the circle below, O is the center. Find the size of the angles marked x and y.



8. Without using a table or calculator, evaluate the following $\frac{68.75^2-31.25^2}{3.75}$
9. Given that $P = \begin{bmatrix} 3x+4 & x^2-2 \\ 2 & x \end{bmatrix}$, find the value of x for which the matrix P is singular.
10. Solve the inequality and represent the solution on a number line.

$$2y - 5(y-4) > 17$$

SECTION B: (12 Marks each)

*Attempt any **five** questions from this section*

11. The table below shows marks obtained by students in a music test.

Class	1-10	11-20	21-30	31-40	41-50	51-60	61-70
Frequency	7	5	8	12	7	3	8

(a) using an assumed mean of 35.5, calculate the mean.

(b) Use the data to calculate the median mark.

12. Two dice are tossed and the product of the two numbers that show up on top is noted.

(a) draw the possible sample space.

(b) Find the probability that the product got is:

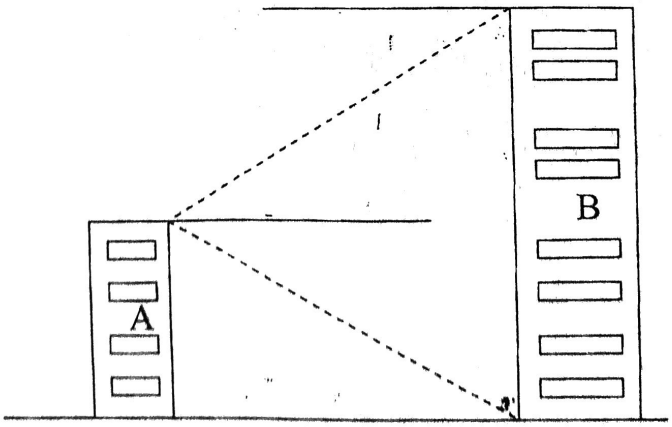
(i) a prime number,

(ii) a triangular number,

(iii) greater than 10

13. (a) Given that $\tan\theta = \frac{-15}{8}$ and $180^0 \leq \theta \leq 360^0$, find without using tables or calculator; the value of $\cos\theta - 2\sin\theta$.

(b) The figure shows two buildings A and B, 200m apart. The angle of depression of the top of building A from B is 30^0 and the angle of depression of the foot of building B from the top of building A is 60^0. Calculate the height of building B.



14. Using a pair of compasses, ruler and a pencil only,
(a) Construct triangle ABC with AB= 9cm, AC = 7.5 cm and BC = 8.5 cm.
(b) Draw perpendicular bisectors of AB and AC, and locate their point of intersection O.
(c) Draw a circle passing through the points A, B and C and write down its radius.
(d) Calculate the area of the minor sector AOC

15. A transformation represented by the matrix $T = \begin{pmatrix} 4 & 6 \\ 1 & 2 \end{pmatrix}$ maps the vertices of A, B and C of a triangle onto the points $A_1(6,2)$, $B_1(16, 7)$ and $C_1(22,9)$ respectively,
Find the
(a) Inverse of T and hence the coordinates of A, B and C
(b) Area of triangle ABC and hence the area of its image $A_1B_1C_1$.

16. Four houses; Arua (A), Sembabule (S), Gomba (G) and Lira (L) Participated in football inter house competition in two rounds. The results as given below;

1st Round

A-Won one, drew three and lost two matches

S-Won two, drew two and lost two matches.

G-Won three, drew two and lost one match.

L-Drew two lost four and did not win any match

2nd Round

A-Won one drew two and lost three matches.

S-Won two, drew one and lost three matches.

G-Won two, drew three and lost one match.

L-Won one drew four and lost one match.

(a) Write down a 4×3 matrix which shows the performance of the houses in
   (i) Each of the rounds
   (ii) Both rounds.

(b) Three points are awarded for a win, one point for a draw and no point for a loss.
   (i) Write down 3×1 matrix to represents the awards of points.
   (ii) Using matrix multiplication, determine which house won the competition.

17. (a) Draw the graph of the equation $y = -x^2 + 4x - 3$ for the domain $\{-1 \leq x \leq 5\}$ and state its maximum value.

(b) Use your graph to solve

(i) $x^2 - 4x + 3 = 0$

(ii) $x^2 - 3x - 4 = 0$

END