

**Uganda Certificate of Education
RESOURCEFUL MOCK EXAMINATIONS 2020
MATHEMATICS
PAPER 1
2 HOURS 30 MINUTES**

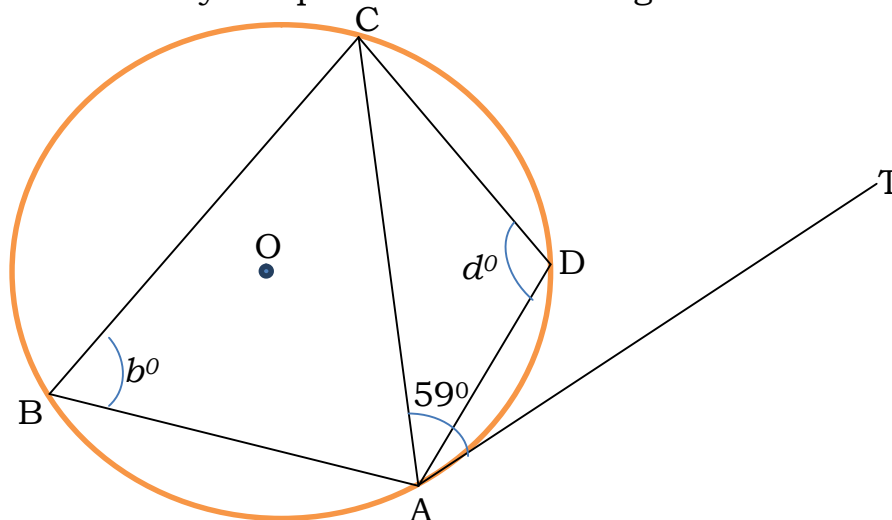
INSTRUCTIONS TO CANDIDATES

- Answer **all** the questions in Section **A** and NOT more than **Five** from Section **B**.
- All necessary working **must** be shown clearly.
- Silent, non-programmable scientific calculators and mathematical tables with a list of formulae may be used.

SECTION A:(40 MARKS)

Attempt **all** questions in this section

1. Given that $a * b = 3a^2 - 2b$, evaluate $5 * (4 * 8)$. (4marks)
2. Make R the subject of the equation; $P = \sqrt{\frac{4A}{M+3R}}$ (4marks)
3. Use factorization method to solve the equation $15x^2 + x - 6 = 0$. (4marks)
4. Find the inverse of the matrix; $A = \begin{pmatrix} -6 & 6 \\ -3 & 4 \end{pmatrix}$. (4marks)
5. In the diagram below, O is the centre of the circle and TA is a tangent to the circle. ABCD is a cyclic quadrilateral and angle $TAC = 59^\circ$.



Find the values of the angles marked *b* and *d*. (4marks)

6. The table below shows the marks obtained by 40 students in a Chemistry Practical test.

Marks	10 – 19	20 – 29	30 – 39	40 – 49	50 – 59
Number of students (f)	8	10	12	8	2

Calculate the mean mark. (4marks)

7. Solve the inequality; $\frac{x+1}{5} - \frac{2x-3}{3} < 4$. (4marks)

8. A two digit number is written at random using the numerals 1, 3 and 4 without repeating any numeral.

a) Write down the possibility space.

b) Find the probability that the number written is a prime number. (4marks)

9. Find the coordinates of the images of the points $R(3, -2)$ and $S(2, 7)$ under the matrix of transformation $\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$. (4marks)

10. Given that $\tan\theta = \frac{5}{12}$ and $180^\circ < \theta < 360^\circ$, find without using mathematical tables or a calculator the value of $\sin\theta - \cos\theta$. (4marks)

SECTION B (60MARKS)

Answer any **five** questions from this Section.

11. a) Given that $x^2 - y^2 = 32$ and $x - y = 2$, determine the values of x and y . (5marks)

b) Two taxi-minibuses a Nissan and a Fuso transported students from Luzira to Kampala. when Nissan had made 3 journeys, the Fuso had made 2, and they had transported 107 students altogether. When the Nissan had made 2 journeys and the Fuso 4, they had transported 146 students altogether. If each journey made by each taxi-minibus was at full capacity, find the capacity of each taxi-minibus. (7marks)

12. The table below shows the heights in a class of 40 senior one students of a certain school.

Height	140 – 144	145 – 149	150 – 154	155 – 159	160 – 164	165- 169	170 – 174
Number of students (f)	2	5	9	10	7	5	2

a) Use the table to calculate the;

i) Mean height

ii) Median height (8marks)

b) Draw a histogram for the data and use your histogram to estimate the modal height of the students. (4marks)

16. a) Given that matrix $A = \begin{pmatrix} 3 & 1 & 2 \\ 0 & -4 & 5 \end{pmatrix}$, $B = \begin{pmatrix} 1 & -1 \\ 0 & 3 \\ 6 & 2 \end{pmatrix}$ and $P = AB$.

i) determine the order of P.

ii) find the matrix P (6marks)

b) Solve the following simultaneous equations using matrix method. (6marks)

$$2x - y = 8$$

$$y + 3x = 7$$

17. a) By shading the unwanted regions, show on a graph the region satisfying the inequalities below;

i) $x \geq 0$

ii) $y \geq 0$

iii) $y > x$

iv) $3x + 2y \leq 24$

v) $3x + y \geq 15$ (8marks)

b) Use your graph to find the integral values of x and y, which give the minimum value for both $3x + 2y$ and $3x + y$ (4marks)

END