

P 456/1
MATHEMATICS
PAPER 1

2 1/2 Hours

UGANDA CERTIFICATE OF EDUCATION

INTERNAL MOCK EXAMS 2019

MATHEMATICS

Paper 1

2 1/2 Hours

INSTRUCTIONS TO CANDIDATES

Answer **all** questions in section **A** and **five** questions in section **B**.

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

All necessary calculations must be shown clearly.

Begin each answer on a **fresh** sheet of paper

Silent non programmable scientific calculators may be used.

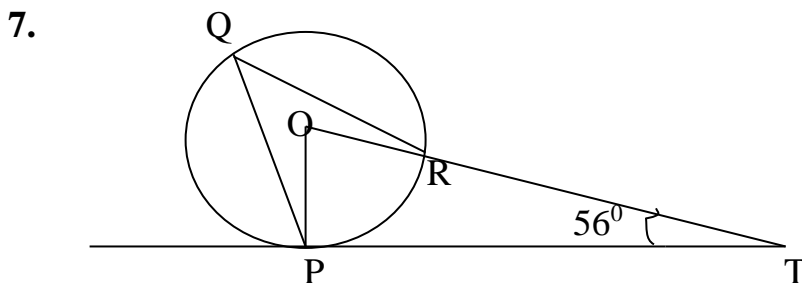
Mathematical tables and **squared** papers are **provided**

No paper should be given for rough work.

States the degree of accuracy at the end of each answer attempted using a calculator or tables and indicate **Cal** for calculator or **Tab** for mathematical tables.

SECTION A (40 Marks)

1. Solve for K in the equation. $\frac{2k-5}{3} - \frac{3k-1}{4} = \frac{3}{2}$ (04mks)
2. A transformation whose matrix $M = \begin{pmatrix} 1 & -2 \\ 1 & -1 \end{pmatrix}$ maps the points A and B unto $A^1(6, 5)$ and $B^1(-4, -3)$ respectively. Write down the coordinates of A and B. (04mks)
3. Make y the subject of the formula $T = 4\pi \frac{\sqrt{x^2 + y^2}}{\delta h}$. (04mks)
4. Four years ago, Mukono District bought a tractor at shs. 150m million. The value of a tractor depreciates at the rate of 12% of its value at the beginning of each year. The disposal committee sold the tractor to Paul for 102 million. Calculate how much more money the District received than the tractor is worth. (04mks)
5. Without using tables or calculator find the value of $\sin\theta + \tan\theta$ given that $\cos\theta = \frac{20}{29}$ and that θ is a reflex angle. (04mks)
6. Obtain the inverse of $K = \begin{pmatrix} 2 & -1 \\ 4 & 3 \end{pmatrix}$ and hence solve $2r - t = 3$
 $4r + 3t = 7$. (04mks)



In the figure, PT is a tangent and ORT, is a straight line through the centre O, given that angle RTP = 56°. Find

- i) Angle POT.
- ii) Angle PQR. (04mks)

8. The velocity $V \text{ ms}^{-1}$ of an object is inversely proportional to the time taken $t(\text{s})$. When the velocity is 15ms^{-1} , the time is 30 seconds. Find the;
- Time when velocity is 25ms^{-1} .
 - Velocity when time is 90 seconds. (04mks)
9. In a basket of fruits, there are 15 oranges and 9 apples. If two fruits are picked from the basket at random without replacement, what is the probability that one is an orange and the other is an apple? (04mks)
10. The table below shows the number of exercise books used up by the students of Bishop's Senior School in a term

No. of books	Under 5	6 - 10	11- 15	16 - 20	21 – 25	26 - 30
No. of students	10	12	20	30	18	8

Draw a cumulative frequency curve for the data and use it to estimate the median

SECTION B (60 Marks)

Attempt any five questions from this section

11. OABC is a square with vertices O (0, 0), A (2, 0), B (2, 2) and C (0, 2). OA'B'C' is the image of OABC under a reflection in the line $y = x$
- Plot OABC and OA'B'C' on the same axes and determine the matrix M representing this reflection. (07mks)
 - The points O(0,0), A''(0,4), B''(-4,4) and C''(-4,0) are the images of O, A', B', and C' under a transformation given by N. Describe fully the transformation represented by N. (02mks)
 - Write down the matrix N and hence determine the matrix which is equivalent to transformation M followed by N. (03mks)

12. A plane flies on a bearing of 065° from airport A at a steady speed of 200kmh^{-1} for 2 hours, and reaches airport B. Keeping the same speed, the plane leaves B, takes bearing 150° flies for $1\frac{1}{2}$ hours and reaches C. from C the plane takes a bearing 230° and flies at a steady speed of 300kmh^{-1} to airport D. The entire journey takes 5 hours.

- (a) Use a suitable scale to draw the journey accurately.
- (b) What time will the plane take to fly from D back to A if its speed is 100kmh^{-1} and on what bearing?

13. The table below shows height of seedlings in a nursery bed

Height(cm)	2.3 - 2.7	2.8 - 3.2	3.3 - 3.7	3.8 - 4.2	4.3 - 4.7	4.8 - 5.2	5.3 - 5.7
Frequency	2	8	15	24	18	6	2

Calculate the;

- i) Mean height using a working mean of 4.
- ii) Mode.
- iii) Median. (12mks)

14.(a) Using mathematical tables evaluate $\frac{3\sqrt{9.945 \times 0.06}}{3.45}$ (04mks)

(b) Kelly bought two shirts and three pairs of trousers at shs 17,500/=. If he had bought three shirts and two pairs of trousers he would have saved shs. 2500/=. Molly bought four shirts and three trousers at the same prices as Kelly. How much did she spend? (04mks)

(c) Factorize $5x + 3x^2 - 2$. Hence solve $3x^2 + 5x - 2 = 0$ (04mks)

15. Kadugala ordered for shirts from Katwekembe Wholesale shop as follows.

	Size				
		small	medium	large	Extra large
Colour	White	0	40	30	2
	Blue	25	0	20	10
	Green	4	22	15	13

Given below is the cost for each size of shirt.

	Size			
	Small	Medium	large	Extra large.
Cost (Ushs.)	10,000	25,000	30,000	35,000

(a) Write down a

- i) 4 x 3 matrix for the order of the shirts made.
- ii) 4 x 1 cost matrix.

(b) Given that Kadugala had to pay a tax of 20% of the cost of shirts purchases, find his expenditure on the order.

16.(a) The probability that Maria passes her examination is $\frac{1}{3}$ and the probability that Betty fails her examination is $\frac{1}{4}$. Find the probability that;

- i) They both pass.
- ii) One passes and one fails
- iii) They both fail. (06mks)

(b) Two dice are thrown and the sum of their scores is noted as the outcomes construct a table showing all possible outcomes. What is the probability that the sum of their scores is;

- i) 4
- ii) More than 4
- iii) 4 Or more than 4
- iv) Prime number.

17. A school warden plans to use two vehicles for transporting back 800 students on the closing day of the term. He has a Costa of capacity 40 and Kamunye of capacity 20 students. The cost of each journey for a Costa is shs. 20,000 and for the Kamunye is 15,000. The Kamunye cannot have twice journeys more than the Costa. The available amount for the transportation is 100,000/=.

- (a) Write down all inequalities representing all the above information.
- (b) Show the region of intersection of graph.
- (c) Find the minimum amount of that can be spent on transport by the school warden. (12mks)

END