NATIONAL MATHEMATICS CONTEST
PRIMARY-LEVEL PAPER 1.

NAMES: _____ DATE OF BIRTH: _____

SCHOOL: _____ CLASS: _____

GENDER: _____ DISTRICT: _____

INSTRUCTIONS TO CANDIDATES AND SUPERVISORS:

Do not turn this page until you have been instructed to do so. This competition is conducted on the assumption that proper security is maintained. Uganda Mathematical Society reserves the right, should there be evidence of any breach of security or any suspicion, to reject scripts from a particular school/institution.

PLEASE, NOTE CAREFULLY:

1. **WRITE YOUR ANSWERS IN THE SPACES PROVIDED. MORE SPACE IS AVAILABLE AT THE END.**
2. Date: Saturday, 6th April, 2024.
3. Time: Exactly 2 hours and 15 Minutes (from 9 : 00am to 11 : 15am)
4. Type:
   (a) This paper consists of two sections and each section carries 50 marks.
   (b) Attempt as many questions as you can. The total marks scored from all the questions you attempt will be your final score.
   (c) No marks will be awarded for an answer if **no** clear and logical layout of the working is shown.
5. **Indicate your names, date of birth, school and district on all your answer sheets in capital letters.**
6. All diagrams/figures in this contest are not to scale.
7. Immediately the paper is done, the answer script(s) must be forwarded to:

   Hassan Wasswa Kayondo,
   Contest Coordinator, Uganda Mathematical Society,
   c/o Department of Mathematics, Makerere University,
   P.O. Box 7062, Kampala,
   Telephone contact: +256200955574/+256771696417.

8. Answer scripts should be received **latest, Monday 8th April,** 2024.
9. *National Mathematics Contest* 2024 *Paper* 2 *will be done on* 29*th June,* 2024 *at various centres and* **ALL** *participants who qualify for Paper* 2 *are cordially invited to the certificate and prize giving ceremony on Saturday* 27*th July,* 2024 *at 9:00am at Makerere University, Kampala.*
10. **UGANDA MATHEMATICAL SOCIETY** wishes you success in this year's contest.

SECTION A : 5 marks each

1. Last night was too cold, the temperature was -5^oC. It is now 6^oC. How many degrees warmer is it now?

2. If a machine produces 300 items in one minute, how many would it produce in 10 seconds?

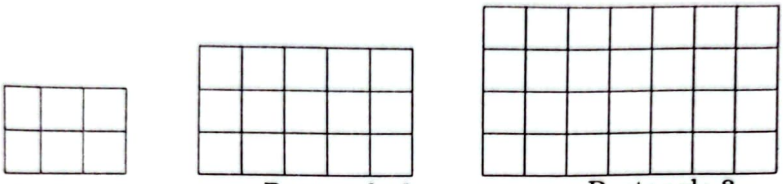
3. The mean of the numbers $4, 12, 9, 8, x, 2x$ is 8. What is the value of x?

4. A new mathematical operation, $\oslash$, is defined by $a \oslash b = \dfrac{2a}{b}$. If $a \oslash 4 = 18$, what is the value of a?

5. Maria's gadget takes five-digit positive integers as input. When the 5-digit integer $ABCDE$ is input, the gadget outputs the positive integer $A + B \times C + D \div E$. What will be the output when the input is 30263?

6. What fraction goes in the $\boxed{?}$ to make the equation $\dfrac{2}{3} + \dfrac{3}{4} + \dfrac{4}{5} = \dfrac{5}{6} + \dfrac{6}{7} + \boxed{?}$ true?

7. Squares measuring 1cm by 1cm are arranged to form the following sequence of rectangles:



Rectangle 1 Rectangle 2 Rectangle 3

Many more rectangles are drawn, Determine the perimeter of Rectangle 5.

8. A bat is flying east. Sadly, it is knocked by an eagle which spins it 225^0 clockwise. What direction is the bat facing now?

9. My mathematics teacher master Lubega has 18 single socks. He puts on clean socks every three days. How many days can he wear these socks before he has to wash them all?

10. The digits of the year 2024 total 8, that is, $2+0+2+4=8$. How many years will it be until this happens again?

SECTION B : (10 marks each)

11. At Monday's practice, Lydia sprints 200m 24 times. She rests for 30 seconds between each consecutive pair of sprints. Lydia sprints at a constant speed of 8m/s.

    (a) How many times does Lydia take the 30 seconds rest sessions?

    (b) Determine Lydia's total practice time in minutes.

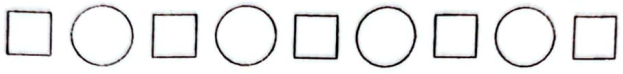
12. Three tanks $T1, T2, T3$ contain water. The number of litres in each is shown in the table below.

$T1$	$T2$	$T3$
3500	1600	3900

    (a) Water is moved from tanks $T1$ and $T3$ into $T2$ so that each tank contains the same volume of water. How many litres of water are moved from $T1$ to $T2$?

    (b) From **12(a)** above, each tank now has the same volume of water and each tank is 0.25 full. How many litres must be added to each tank to make it full?

13. Place the integers $1, 2, 4, 5, 6, 9, 10, 11, 13$ in the circles and squares below with one number in each shape. Each integer must be used exactly once and the integer in each circle must be equal to the sum of the integers in the two neighbouring squares.



14. In a special sequence, the first term is a positive integer and each term after the first is determined in the following way:
    - if a term, n, is odd, the next term is $n + 3$,
    - if a term, n, is even, the next term is $n + 4$,
    - if a term, n, is a prime, the next term is $n + 5$.

    (a) If the first term in the special sequence is 51, what is the fifth term in the sequence?

    (b) If the first term in the special sequence is 42, what is the fifth term in the sequence?

    (c) If the third term in the special sequence is 32, what are the possibilities for the first term?

15. Points A, B, C, and D lie along a line, in that order. If $AB : AC = 1 : 5$, and $BC : CD = 2 : 1$. Find the ratio $AB : CD$.

END