THAILAND INTERNATIONAL MATHEMATICAL OLYMPIAD FINAL ROUND 2020 – 2021

Primary 3

Time allowed: 120 minutes

Question Paper

Instructions to Contestants:

1. Each contestant should have ONE Question-Answer Book which CANNOT be taken away.
2. There are 5 exam areas and 6 questions in each exam area. There are a total of 30 questions in this Question-Answer Book. Each question carries 5 marks. Total score is 150 marks. No points are deducted for incorrect answers.
3. All answers should be written on ANSWER SHEET.
4. NO calculators can be used during the contest.
5. All figures in the paper are not necessarily drawn to scale.
6. Write down the answer in the simplest form. If the calculation result is a fraction, please write down the answer as a proper or mixed fraction, decimal figure is also accepted. Marks will NOT be given for incorrect unit.
7. This Question-Answer Book will be collected at the end of the contest.

DO NOT turn over this Question-Answer Book without approval of the examiner.

Otherwise, contestant may be DISQUALIFIED.

All answers should be written on the ANSWER SHEET.

Open-Ended Questions (1^{st} ~30^{th}) (5 points for correct answer, no penalty point for wrong answer)

Logical Thinking

1. According to the pattern shown below, what is the missing number in the box?

1	3	7	13	21
2	4	10	20	34
3	6	?	30	54
4	9	20	44	84
5	6	7	8	9

2. Edward is now playing "Clapping Game". When he needs to call any multiples of 4, he has to clap hands once instead of calling them out. Now the game starts from 3 in an ascending order. After clapping 22 times, what will the next number be?

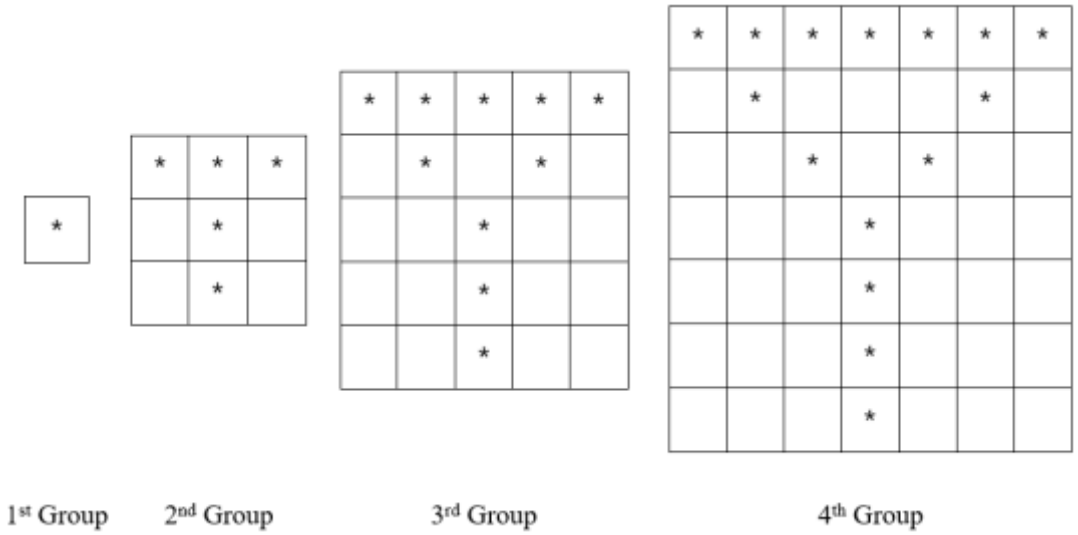
3. In class 3B, all students queue up to form a rectangle. Eric stands on the last row. On his left-hand side, there are 4 students. On his right-hand side, there are 4 students. There are 4 students in front of Eric. How many student(s) is / are there in class 3B?

4. 24^{th} March 2021 is Wednesday. Which day of the week is 14^{th} Aug 2021?

5. According to the pattern shown below, what is the English alphabet in the space provided?

X 、 V 、 S 、 O 、 __ 、

6. According to the pattern shown below, how many ＊ is / are there in the 21^{st} group?



1st Group 2nd Group 3rd Group 4th Group

Question 6

All answers should be written on the ANSWER SHEET.

Arithmetic

7. Find the value of $383+926+300+428+554+127+602$.

8. If *A* represents the same 1-digit number, what is the value of *A* if the equation is correct?

$$\begin{array}{rccc} & & & A \\ \times & 2 & A & 9 \\ \hline & 9 & 9 & 6 \end{array}$$

Question 8

9. Find the value of $18\times13+3\times104+78\times23$.

10. Find the value of $315\div3+315\div9+315\div15+315\div45$.

11. Find the value of $444+449+454+459+464+469+474+479+484+489$.

12. What is the number that should be filled in the blank if the equation below is correct?

$$43\times\_\_\_=258$$

Number Theory

13. The numbers below follow the arithmetic sequence, what is the 18^{th} number?

327、319、311、303、295、…

14. If *A* is an odd number, determine whehter the result of $A\times((3\times A+14)+(11\times A+19))\div A$ is an odd or even number.

15. If *A* and *B* are different digits from 0 to 9, find the value of $A+B$.

$$\begin{array}{rccc} & & A & B \\ \times & & A & A \\ \hline & 2 & 0 & 9 \end{array}$$

Question 15

16. A 3-digit number is divided by 14 to get a remainder of 13. Find the minimum value of this 3-digit number.

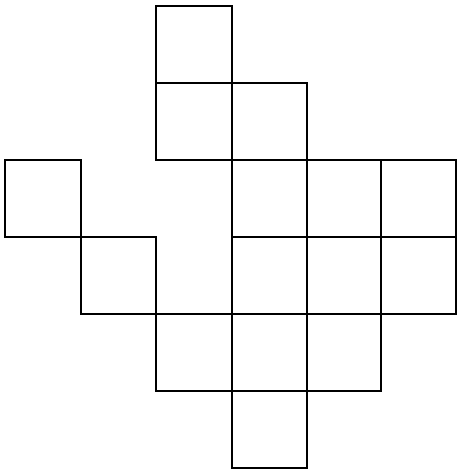
17. The product of *A* and *B* is 612. *A* is 17 times of *B.* Find the value of *A.*

18. The sum of 5 consecutive even numbers is 40. Find the L.C.M. (Least Common Multiple) of all the numbers.

All answers should be written on the ANSWER SHEET.

Geometry

19. How many square(s) is / are there in the figure below?

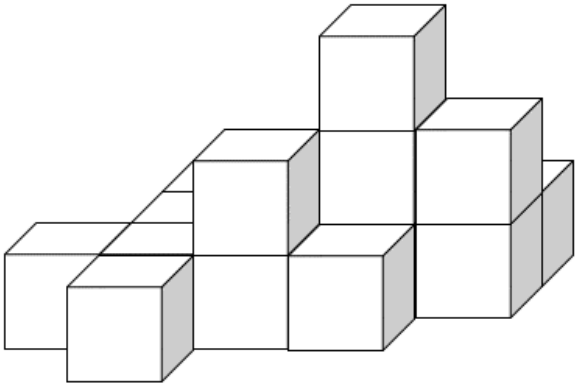


Question 19

20. A square whose sides are 36cm long is cut into 4 squares of side length 18cm. What is the difference in perimeters between 4 small squares and the larger square?

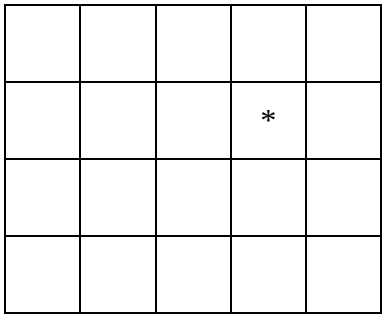
21. A prism has 78 edges, how many face(s) does this prism have?

22. At least how many squares can be seen if viewing the figure below from the right?



Question 22

23. How many rectangle(s) with "*" is / are there in the figure below?



Question 23

24. According to the pattern shown below, what is the figure in the space provided?

Question 24

Combinatorics

25. Find the number of 3-digit even number(s) without repetition of digits.

26. How many 4-digit even numbers can be formed by using 0, 8, 5, 7, 3 and 2? (Each number can only be used once)

27. Chris has 26 $1 coins, 9 $2 coins and 9 $5 coins and a book costs $8. If he can only buy 1 book each time and no change will be provided for each payment, at most how many book(s) can he buy?

28. Numbers are drawn from 85 integers 46 to 130. At least how many number(s) is / are drawn at random to ensure that there are two numbers whose difference is 11?

29. It is known that every digit not smaller than the previous digit in a number is called "special number". For example, 123 and 366. How many 3-digit "special number" which hundreds digit can only be 2, 3, 4 and 5 is / are there?

30. Class 3A has 33 students. Each student has to exchange presents with each of their classmates. How many time(s) is / are there to exchange the presents?

~ End of Paper ~