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泰國國際數學競賽初賽 2020 - 2021

**THAILAND INTERNATIONAL  
MATHEMATICAL OLYMPIAD  
HEAT ROUND 2020 - 2021**

小學五年級 Primary 5

時限：90 分鐘

Time allowed: 90 minutes

試題

**Question Paper**

考生須知：

**Instructions to Contestants:**

1. 本卷包括 試題 乙份，試題紙不可取走。

Each contestant should have ONE Question-Answer Book which CANNOT be taken away.

2. 本卷共 5 個範疇，每範疇有 5 題，共 25 題，每題 4 分，總分 100 分，答錯不扣分。

There are 5 exam areas and 5 questions in each exam area. There are a total of 25 questions in this Question-Answer Book. Each carries 4 marks. Total score is 100 marks. No points are deducted for

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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.

請將答案寫在 **答題紙** 上。

All answers should be written on the ANSWER SHEET.

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incorrect answers.

3. 請將答案寫在 **答題紙** 上。

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4. 比賽期間，不得使用計算工具。

NO calculators can be used during the contest.

5. 本卷中所有圖形不一定依比例繪成。

All figures in the paper are not necessarily drawn to scale.

6. 比賽完畢時，本試題會被收回。

This Question-Answer Book will be collected at the end of the contest.

本試題不可取走。

**THIS Question-Answer Book CANNOT BE TAKEN AWAY.**

未得監考官同意，切勿翻閱試題，否則參賽者將有可能被取消資格。

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

Otherwise, contestant may be **DISQUALIFIED**.

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Open-Ended Questions (1<sup>st</sup> ~25<sup>th</sup>) (4 points for correct answer, no penalty point for wrong answer)

Logical Thinking

1. This month is October. Which month will 2451 months be later?

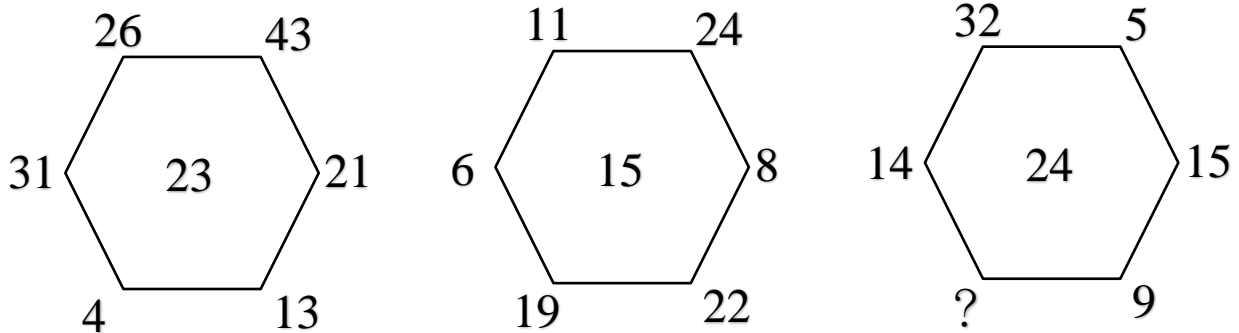
Bulan ini adalah bulan Oktober. Bulan apakah 2451 bulan kemudian?

2. There are a total of 56 chickens, ducks and rabbits in a farm. The animals have a total of 146 legs. If the number of rabbits has 10 more than ducks, find the difference between the number of chicken and rabbits.

Terdapat total 56 ayam, bebek dan kelinci di sebuah peternakan. Jumlah keseluruhan kaki dari binatang-binatang itu adalah 146 kaki. Jika jumlah kelinci 10 lebih banyak dari jumlah bebek, carilah selisih jumlah ayam dan kelinci.

3. According to the pattern shown below, what is the number in the blank?

Berdasarkan pola di bawah ini, berapa bilangan yang dilambangkan dengan '?'?



Question 3

Soal No. 3

4. It requires 12 people to take 34 days to complete a task. How many day(s) is / are needed for 8 people to finish the same task?

Diperlukan 12 orang untuk menyelesaikan sebuah pekerjaan dalam 34 hari. Berapa hari yang diperlukan 8 orang untuk menyelesaikan pekerjaan yang sama?

請以最簡形式填寫答案，若計算結果是分數，請確保為真分數或帶分數，或將計算結果寫成小數。錯誤單位將不給予任何分數。

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5. According to the pattern shown below, how many # is / are there in the 8<sup>th</sup> group?

Berdasarkan pola di bawah ini, berapa banyak # yang ada pada Kelompok 8?

#	
#	#

1<sup>st</sup> Group  
Kelompok 1

#		#	
	#		#
#		#	
#	#	#	#

2<sup>nd</sup> Group  
Kelompok 2

#		#		#	
	#		#		#
#		#		#	
	#		#		#
#		#		#	
#	#	#	#	#	#

3<sup>rd</sup> Group  
Kelompok 3

#		#		#		#	
	#		#		#		#
#		#		#		#	
	#		#		#		#
#		#		#		#	
	#		#		#		#
#		#		#		#	
#	#	#	#	#	#	#	#

4<sup>th</sup> Group  
Kelompok 4

Question 5

Soal No. 5

Arithmetic

6. Find the value of  $81 \times 81 - 19 \times 19$ .

Carilah nilai dari  $81 \times 81 - 19 \times 19$ .

7. Find the value of  $(17 \times 18 \times 19 - 1615) \div 13$ .

Carilah nilai dari  $(17 \times 18 \times 19 - 1615) \div 13$ .

請以最簡形式填寫答案，若計算結果是分數，請確保為真分數或帶分數，或將計算結果寫成小數。錯誤單位將不給予任何分數。

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8. Find the value of  $\frac{3}{4 \times 8} + \frac{3}{8 \times 12} + \dots + \frac{3}{40 \times 44} + \frac{3}{44 \times 48}$ .

**Carilah nilai dari**  $\frac{3}{4 \times 8} + \frac{3}{8 \times 12} + \dots + \frac{3}{40 \times 44} + \frac{3}{44 \times 48}$ .

9. Using the method of  $S = \frac{3S - S}{2}$ , find the value of  $4 + 12 + 36 + 108 + \dots + 2916$ .

**Dengan menggunakan metode**  $S = \frac{3S - S}{2}$ , **carilah nilai dari**  $4 + 12 + 36 + 108 + \dots + 2916$ .

10. Find the value of  $\left(\frac{5}{2} + \frac{5}{4} + \frac{5}{6}\right) \div \left(\frac{1}{1} + \frac{1}{2} + \frac{1}{3} + \frac{1}{4}\right)$ .

**Carilah nilai dari**  $\left(\frac{5}{2} + \frac{5}{4} + \frac{5}{6}\right) \div \left(\frac{1}{1} + \frac{1}{2} + \frac{1}{3} + \frac{1}{4}\right)$ .

### Number Theory

11. It is given that  $a \neq b$ . Define the operation symbol  $a \otimes b = \frac{(a+1)(b-2)}{a \times 2 + b \times 3}$ , find the value of  $(7 \otimes 7) \times (6 \otimes 4)$ .

**Diketahui**  $a \neq b$ . **Didefinisikan operasi simbol**  $a \otimes b = \frac{(a+1)(b-2)}{a \times 2 + b \times 3}$ , **carilah nilai dari**  $(7 \otimes 7) \times (6 \otimes 4)$

12. If a 10-digit number  $\overline{202A1777B7}$  is divisible by 99, find the value of  $A$ .

**Jika bilangan 10-angka**  $\overline{202A1777B7}$  **dapat dibagi 99, carilah nilai dari**  $A$ .

請以最簡形式填寫答案。若計算結果是分數，請確保為真分數或帶分數，或將計算結果寫成小數。錯誤單位將不給予任何分數。  
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答題紙
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 上。

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13. The product of positive numbers  $A$  and  $B$  is 448.  $A$  is 7 times of  $B$ . Find the value of  $A$ .

Hasil kali bilangan positif  $A$  dan  $B$  adalah 448.  $A$  adalah 7 kali  $B$ . Carilah nilai dari  $A$ .

14. Find the unit digit of  $A$  if  $A = \underbrace{2021 \times 2021 \times \dots \times 2021}_{2021's} \times 3 \times 13 \times 23 \times \dots \times 2023$ .

Carilah angka satuan dari  $A$  jika  $A = \underbrace{2021 \times 2021 \times \dots \times 2021}_{2021's} \times 3 \times 13 \times 23 \times \dots \times 2023$ .

15. Mr Lee gives some pencils to students. If everyone gets 17 pencils, 1 pencil will be left. If everyone gets 14 pencils, 28 pencils will be left. How many pencil(s) does Mr Lee have?

Mr. Lee membagikan pensil kepada murid-murid. Jika setiap murid mendapatkan 17 pensil, maka akan tersisa 1 pensil. Jika setiap murid mendapatkan 14 pensil, maka akan tersisa 28 pensil. Berapa banyak pensil yang Mr. Lee punyai?

請以最簡形式填寫答案。若計算結果是分數，請確保為真分數或帶分數，或將計算結果寫成小數。錯誤單位將不給予任何分數。

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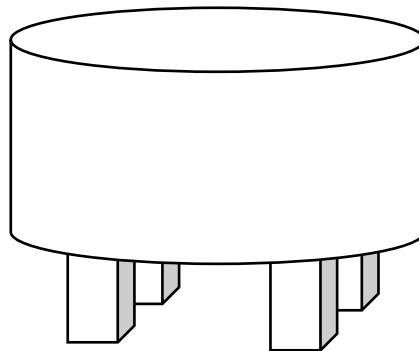
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Geometry

16. Refer to the following figure, the figure is formed by 4 identical cuboids and 1 cylinder. The long, width and height of the cuboid are 5, 7 and 12 respectively. If the surface area of the figure is 3000, what is the surface area of the cylinder?

Berdasarkan gambar di bawah, gambar ini dibentuk dari 4 balok identik dan 1 tabung. Panjang, lebar dan tinggi dari balok-balok tersebut adalah 5, 7 dan 12. Jika luas permukaan gambar ini adalah 3000, berapakah luas permukaan dari tabung?



Question 16

Soal No. 16

請以最簡形式填寫答案。若計算結果是分數，請確保為真分數或帶分數，或將計算結果寫成小數。錯誤單位將不給予任何分數。

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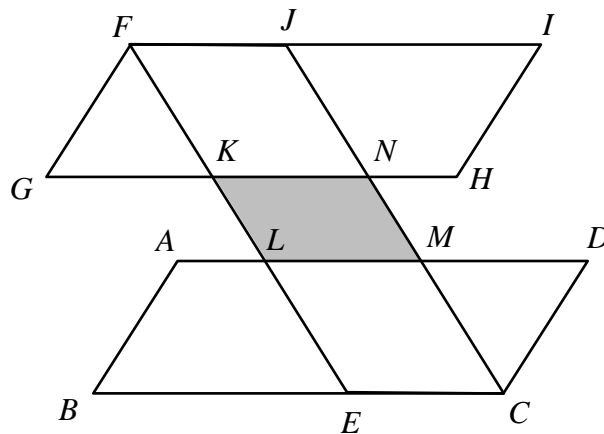
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17. The figure below is formed by 3 identical parallelograms  $ABCD$ ,  $FGHI$ ,  $FECJ$ . Their side lengths are 12 and 5 respectively. Find the perimeter of the shaded region  $KLMN$ .

Gambar di bawah ini dibentuk dari 3 jajaran genjang identik  $ABCD$ ,  $FGHI$ ,  $FECJ$ . Panjang sisi-sisinya adalah 12 dan 5. Carilah keliling dari area abu-abu  $KLMN$ .



Question 17

Soal No. 17

請以最簡形式填寫答案。若計算結果是分數，請確保為真分數或帶分數，或將計算結果寫成小數。錯誤單位將不給予任何分數。  
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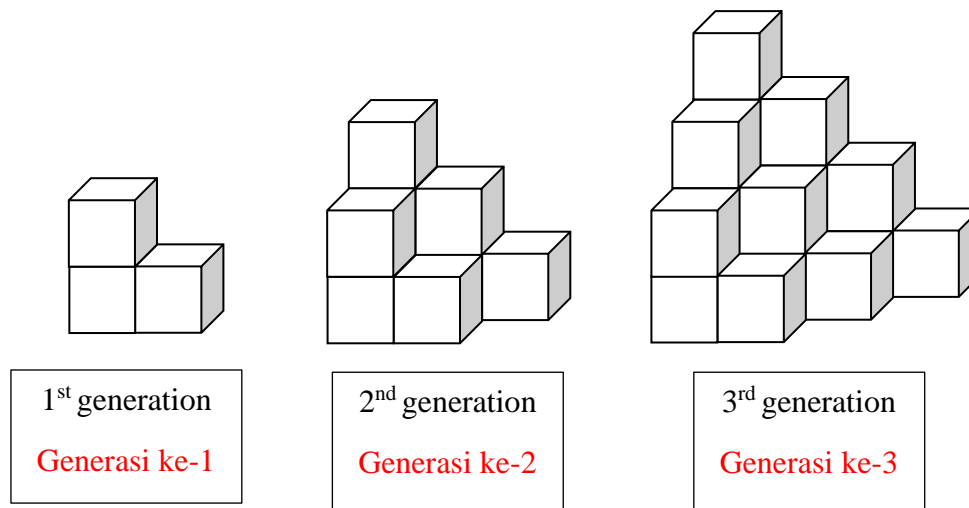
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18. According to the pattern shown below, how many cube(s) is / are there in 8<sup>th</sup> generation?

Berdasarkan pola di bawah ini, berapa banyak kubus yang ada di generasi ke-8?



Question 18

Soal No. 18

19. A cube with side length 9 is divided into cubes with side length 3. By how much does the surface area increase?

Sebuah kubus dengan panjang sisi 9 dibagi menjadi kubus-kubus lebih kecil dengan panjang sisi 3. Berapa banyak luas permukaannya bertambah?

請以最簡形式填寫答案，若計算結果是分數，請確保為真分數或帶分數，或將計算結果寫成小數。錯誤單位將不給予任何分數。  
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答題紙
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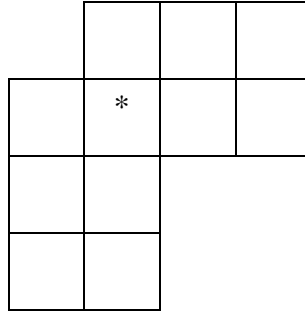
 上。

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20. How many rectangle(s) with “\*” is / are there in the figure below?

Berapa banyak persegi panjang yang mengandung “\*” yang ada pada gambar berikut?



Question 20

Soal No. 20

Combinatorics

21. A flight of stairs has 11 steps. Bobby can go up for 1 step or 2 steps each time. How many way(s) is / are there for Bobby to go up the stairs?

Sebuah tangga mempunyai 11 anak tangga. Bobby dapat naik 1 atau 2 anak tangga setiap langkah. Berapa banyak cara berbeda Bobby dapat naik tangga tersebut?

22. Numbers are drawn from the 120 integers 31 to 150. At least how many numbers are drawn at random to ensure that there are two numbers whose sum is 88?

Bilangan diambil secara acak dari 120 bilangan bulat dari 31 sampai dengan 150. Setidaknya berapa banyak bilangan yang harus diambil secara acak untuk memastikan ada dua bilangan yang hasil penjumlahannya adalah 88?

23. How many 4-digit odd number(s) is / are there so that the product of digits is 32?

Berapa banyak bilangan ganjil 4-angka yang hasil perkalian angka-angkanya adalah 32?

請以最簡形式填寫答案，若計算結果是分數，請確保為真分數或帶分數，或將計算結果寫成小數。錯誤單位將不給予任何分數。

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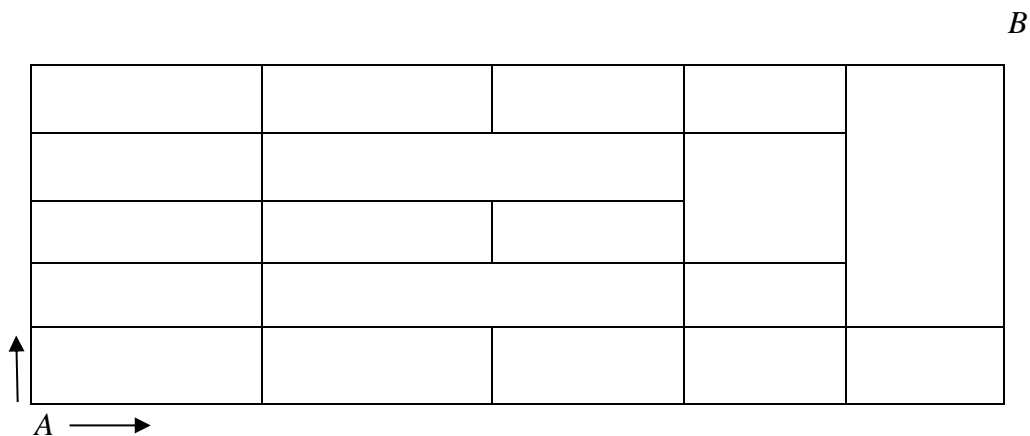
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24. There are 12 boys and 8 girls in a class. Choose 3 boys and 2 girls to form a research group. How many way(s) is / are there in total?

Terdapat 12 anak laki-laki dan 8 anak perempuan di sebuah kelas. Pilih 3 anak laki-laki dan 2 anak perempuan untuk membentuk kelompok penelitian. Berapa banyak cara yang ada secara keseluruhan?

25. If Harry goes from point  $A$  to point  $B$ , each step can only move up or move right. How many way(s) is / are there?

Jika Harry pergi dari titik  $A$  ke titik  $B$ , di tiap langkahnya dia hanya dapat bergerak ke atas atau ke kanan, berapa banyak cara yang ada?



Question 25

Soal No. 25

~ 全卷完 ~

~ End of Paper ~

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