5th Challenge for Future Mathematicians'

Bogor, October 27-30, 2018

Individual Contest

Upper Primary School Category

Short Answer

1. What is the unit digit of the product of the first 2018 natural numbers?

2. Re-arrange 27102018 to form a new 8-digit number. Find the difference of the largest and smallest possible 8-digit numbers.

3. Andy divides the number N by 29 correctly and gets a result of 5. Benny uses the same value of N as Andy but he misreads the division sign as an addition sign and instead finds the sum. What answer does Benny get?

4. The length of a rectangle was increased by 40% and the width was decreased by 15%. How many percent did the new area increase?

5. The numbers listed are in a pattern. What is the value of $C + F + M$?

   5, 7, 11, 19, 35, C, F, M

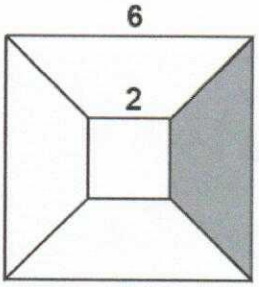
6. What is the ratio of the greatest common divisor and least common multiple of 72 and 96?

7. There are 29 pens and 47 pencils in a box. Each day Andy puts 5 more pens and 3 more pencils to the box. After how many days will we have the same number of pens and pencil in the box?

8. The diagram shows nine cards numbered from 1 to 9. One of the cards is taken out, and the sum of the numbers of the remaining cards is 4 times of that card. What is the number on the card that was taken out?

1	2	3	4	5	6	7	8	9

9. A large square has side length 6 cm. It is divided into four identical trapezoids and a small square, as shown in the diagram. The small square has side length 2 cm. What is the area in cm^2 of each trapezoid?



10. Three hundred pairs of shoes are packed in 2 large boxes and 6 small boxes, respectively. If the number of shoes in two small boxes is equal to that in one large box, how many pairs of shoes are there in total inside the 6 small boxes?

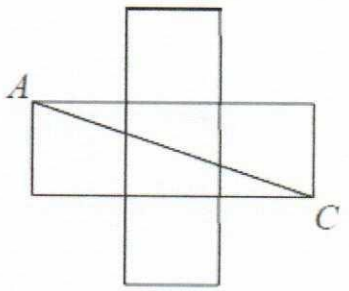
11. Seven friends ate at a restaurant and agreed to pay the total cost equally. Because Andrian forgot to bring his purse, and he only had \$3 in his pocket, for that, each of his six friends paid an extra \$1.50 to cover the payment. What was the total cost?

12. The integers 2, 2, 3, 3, 7, and 8 are written on six cards, as shown. Any number of the six cards is chosen, and the sum of the integers on these cards is determined. Note that the integers 1 and 26 cannot be obtained as sums in this way. What is the number greater than 1 and less than 26 that cannot be obtained?

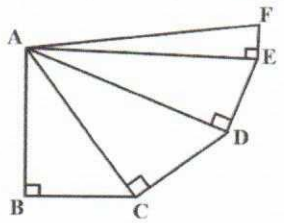
2	2	3	3	7	8

13. The sum of the ages of 2 brothers today is 63. Given that when the elder brother was of the younger brother's age now, the age of the younger brother at that time was half of the elder brother's age now. How old are they now?

14. Find the area of the cross made of five identical squares in the figure, given that the length of AC is 16 cm.



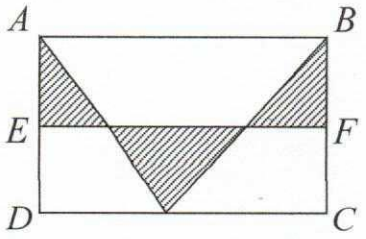
15. Refer to the picture below:



If $AB = 12$ cm, $BC = 5$ cm, $CD = 6$ cm, $DE = 4$ cm, and $EF = 2$ cm, then what is the perimeter, in cm, of the plane?

16. When 169 is divided by a two-digit number, the remainder is 4. Find the sum of all possible two-digit numbers, that satisfies the condition.

17. The length and width of rectangle $ABCD$ are 8 and 6 cm, respectively. E and F are the midpoints on the sides AD and BC respectively. What is the total area, in cm^2, of the shaded areas?



18. How many 4-digit positive integers have digits whose product equals 30?

19. In a town parking area, there are cars and motorcycles. The parking officer count that there are total 210 wheels. The payment for 1 car is \$5 and \$2 for 1 motorcycle. If the number of the motorcycles is larger than the number of cars, so, what is the maximum income that can be collected from that parking area?

20. Nurul wrote all the integers from 1 to 2018 inclusive on a board. She then erased all the integers that are a multiple of 3. Next she reinstated all those integers that are a multiple of 6. Finally, she erased all integers then on the board which are multiple of 27. Of the 2018 integers that began in the list, how many are now missing?

END of THE PROBLEMS