Middle Primary Division Round 2

Questions 1 to 5, 4 marks each

1. Among the numbers 5, 7, 11, 15 and 19, which number cannot be expressed as a sum of two prime numbers?

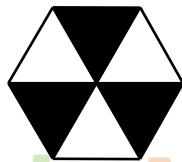   （A）5   （B）7   （C）11   （D）15   （E）19

   Answer：_____

2. There is a dart game in an amusement park where the goal is to hit the black portions of the regular hexagon in order to win a prize. From the choices below, which dart board will give the highest chance of winning?
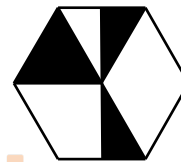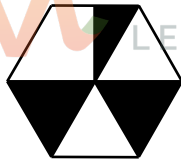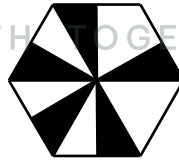
   （A）   （B）   （C）

   （D）   （E）

   Answer：_____

3. What is the units digit of the value of $\underbrace{2 \times 2 \times \cdots \times 2}_{2016 \text{ terms}} + \underbrace{3 \times 3 \times \cdots \times 3}_{2017 \text{ terms}}$?

   （A）1   （B）3   （C）6   （D）7   （E）9

   答：_____

4. Alex bought a total of nine pencils and ball pens. One ball pen costs $3 each, while one pencil costs $2 each. If Alex spent a total of $22, how many ball pens did he buy?

   （A）2   （B）3   （C）4   （D）5   （E）6
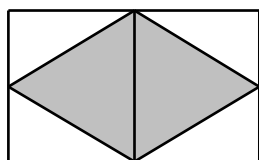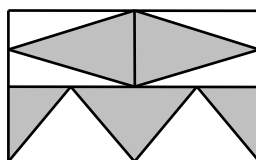
   Answer：_____

5. In each of the following options, the dimensions of the rectangle are 10 cm by 6 cm. There are some shaded triangles inside each rectangle. The vertices of the shaded triangles must be either at the endpoints of a line segment or points that divide it into equal parts. From the options below, which figure has the largest shaded region?
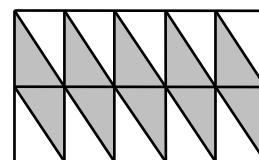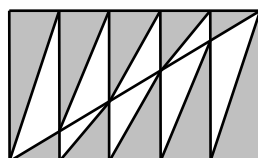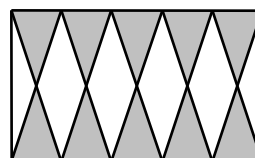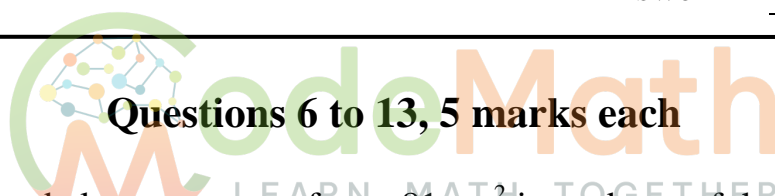
（A） 　　　　　　　　（B） 　　　　　　　　（C）

（D） 　　　　　　　　（E）
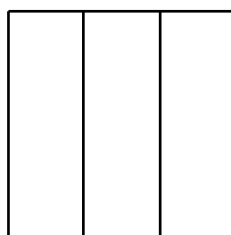
Answer：_____

Questions 6 to 13, 5 marks each

6. In the diagram below, a square of area 81 cm² is made up of three small identical rectangles. What is the perimeter of one small rectangle?

Answer：_____ cm

7. In adding up two numbers, Max has mistakenly read the tens digits '3' of the first number as '5' and the hundreds digit '9' of the second number as '6'. If Max got 2017 as the result, what should be the correct sum of the two numbers?

Answer：_____

8. A hotel staff distributes four room keys to four travelers randomly. It is known that exactly two of the travelers get their correct room keys. How many different ways are there of distributing the keys to the four travelers?
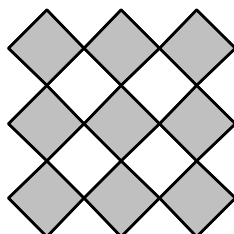
Answer：_____ ways

9. Refer to the diagram below, where 9 black bricks and 4 white bricks are arranged alternately such that it will form a figure in which there are 5 bricks on its diagonals, and all the outer bricks are black.

Using the similar pattern stated above, if we want to form figures in which there are 7 bricks on its diagonals, how many black bricks are required?

Answer：_____ black bricks

10. The average weight of five cars A, B, C, D and E is 200 kg. If the average weight of cars A, B and C is 198 kg, while the average weight of cars C, D and E is 203 kg, what is the weight of car C, in kg?

Answer：_____ kg

11. Fill in each ◯ in the expression below with digits 1, 2, 3, 4, 5 and 6. Each digit can be used once and two 3-digit numbers are formed. What is the minimum difference of the expression below?

◯◯◯－◯◯◯= _____

Answer：_____

12. Six pairs of integers are formed from the list of positive integers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 and 12. It is known that the sums of the five pairs are: 4, 6, 14, 20 and 21. What is the product of the remaining pair of numbers?
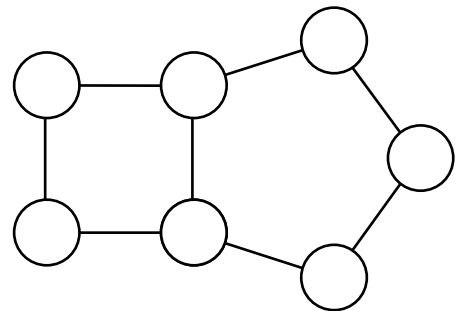
Answer：_____

13. The sum of two three-digit numbers is 999. If the digits in the two three-digit numbers are all different without repetition, how many possible combinations are there?

Answer：_____ combinations

Questions 14 to 15, 20 marks each
(Detailed solutions are needed for these two problems)

14. Fill in the circles with the numbers 1, 2, 3, 4, 5, 6 and 7. Each number can be used once without repetitions. The sum of the digits inside the circles at the four vertices of the square on the left is 15 and the sum of the digits inside the circles at the vertices of the regular pentagon on the right is 24. How many possible arrangements are there?

Answer：_____ arrangements

15. A bag contains 2017 balls that are numbered from 1 to 2017. At least how many balls must be taken out so that among those balls, there will always be 3 balls, in which the sum of the numbers on the first two balls is the number on the third ball?

Answer： _____ balls

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