4^{th} International Mathematics Assessments for Schools
(2014-2015)

Upper Primary Division Round 2

Time: 120 minutes

Printed Name ________________ *Code* __________ *Score* __________

Instructions:

- Do not open the contest booklet until you are told to do so.
- Be sure that your name and code are written on the space provided above.
- Round 2 of IMAS is composed of three parts; the total score is 100 marks.
- Questions 1 to 5 are given as a multiple-choice test. Each question has five possible options marked as A, B, C, D and E. Only one of these options is correct. After making your choice, fill in the appropriate letter in the space provided. Each correct answer is worth 4 marks. There is no penalty for an incorrect answer.
- Questions 6 to 13 are a short answer test. Only Arabic numerals are accepted; using other written text will not be honored or credited. Some questions have more than one answer, as such all answers are required to be written down in the space provided to obtain full marks. Each correct answer is worth 5 marks. There is no penalty for incorrect answers.
- Questions 14 and 15 require a detailed solution or process in which 20 marks are to be awarded to a completely written solution. Partial marks may be given to an incomplete presentation. There is no penalty for an incorrect answer.
- Use of electronic computing devices is not allowed.
- Only pencil, blue or black ball-pens may be used to write your solution or answer.
- Diagrams are not drawn to scale. They are intended as aids only.
- After the contest the invigilator will collect the contest paper.

The following area is to be filled in by the judges;
the contestants are not supposed to mark anything here.

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total Score	Signature
Score																	
Score																	

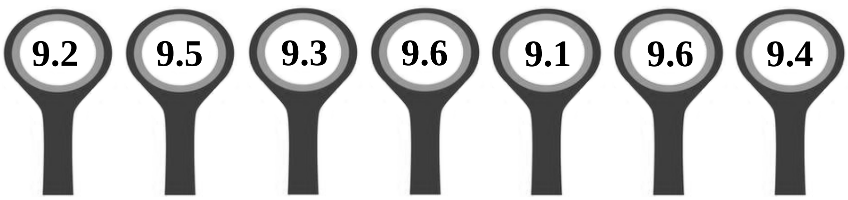
Upper Primary Division Round 2

Questions 1 to 5, 4 marks each

1. What is the value of $32\times37\times75$?
   （A）88075　（B）88800　（C）88200　（D）74000　（E）80800

Answer：______________

2. In a gymnastic competition, an athlete receives a score from each of seven judges. After the highest score and the lowest score have been removed, the average of the remaining five scores is the actual score for that athlete. If the seven judges give scores of 9.2, 9.5, 9.3, 9.6, 9.1, 9.6 and 9.4 to an athlete, what is the actual score for this athlete?



   （A）9.3　（B）9.38　（C）9.4　（D）9.42　（E）9.5

Answer：______________

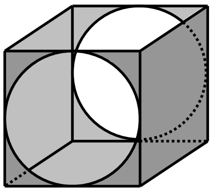
3. There are 4 children in the first row, and each subsequent row has one more child than the preceding row. If there are 39 children altogether, how many children are in the last row?
   （A）5　（B）6　（C）9　（D）15　（E）35

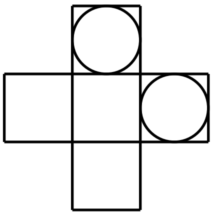
Answer：______________

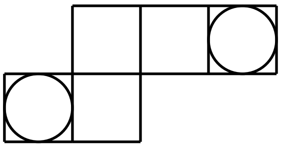
4. When 200 is subtracted from the square of a positive integer *n*, the difference is a three-digit multiple of 4. How many different values can *n* take?
   （A）8　（B）9　（C）16　（D）17　（E）32

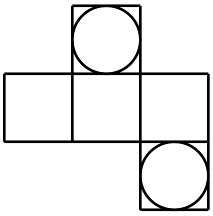
Answer：______________

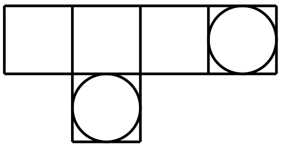
5. From a cubical box without the top, a circle is removed from each of two opposite faces. Which of the following shapes can be folded to form such a box?

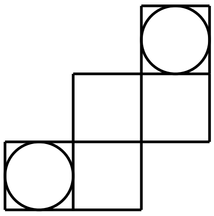


(A) 

(B) 

(C) 

(D) 

(E) 

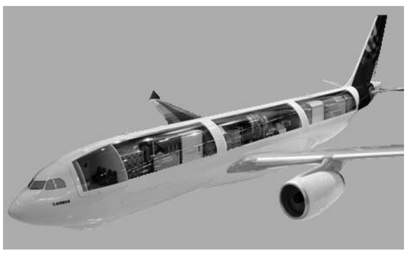
Answer：________________

Questions 6 to 13, 5 marks each

6. If a computer printer is sold at a 10% off discount, a profit of \$220 can still be made. However, if it is sold at a 20% off discount, there will be a loss of \$100. What is the list price of this computer printer?

Answer： \$____________

7. There are three storage compartments in an airplane. The maximum weight which can be stored in them are 10, 16 and 8 tons respectively. The maximum volume which can be stored in them are 66, 84 and 51 m^3 respectively. The airplane is used to transport grain, each ton of which has volume 6 m^3. If the actual weight of grain in each compartment must be in the same proportion to the maximum weight allowed in that compartment, what is the maximum weight of grain the airplane can transport at a time?

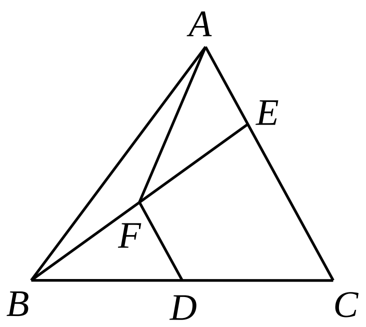


	Front	Middle	Back
maximum weight/tons	10	16	8
maximum volume /m^3	66	84	51

Answer：____________ tons

UP 3

8. In triangle ABC, D is the midpoint of BC. E is an arbitrary point on CA, and F is the midpoint of BE. If the area of triangle ABC is 120 cm^2 and the area of the quadrilateral $AFDC$ is 80 cm^2, what is the area, in cm^2, of triangle BDF?



Answer： ________ cm^2

9. The expressions $1000-991=9$ and $1001-994=7$ are examples in which the difference between a four-digit number and a three-digit number is a one-digit number. How many such expressions are there, including these two examples?

Answer： ________ expressions

10. An ant starts from the top left corner square of a 3×5 chessboard. It moves from a square to the adjacent square in the same row or column. After visiting every square exactly once, it ends up at the square in the middle row second column from the right. How many different paths can the ant follow?

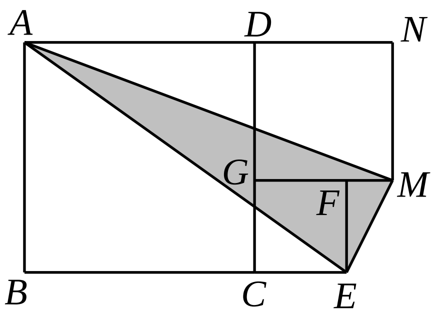
A				
			B	

Answer： ________ paths

11. Lily's eight-digit telephone number is divisible by 3 and 5. Micky can only remember its first six digits, which are 8, 9, 2, 0, 1 and 5 in that order. What is the maximum number of times Micky has to dial before reaching the correct telephone number?

Answer：____________

12. *ABCD*, *CEFG* and *DGMN* are squares, with *G* on *CD* and *F* on *GM*. If *AB* = 10 cm and *MN* = 6 cm, what is the area, in cm^2, of triangle *AME*?



Answer：____________ cm^2

13. The numbers 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10 are divided into two groups. The sum of all the numbers in one group is *n*, while the product of all the numbers in the other group is also *n*. What is the maximum value of *n*?

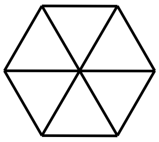
Answer：____________

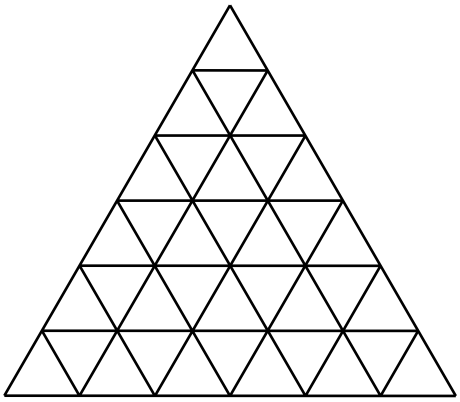
Questions 14 to 15, 20 marks each
(Detailed solutions are needed for these two problems)

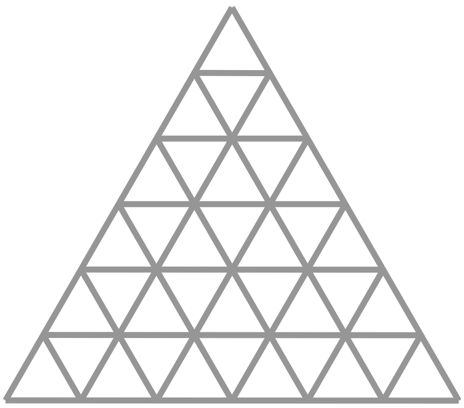
14. We increase by 1 each of three prime numbers, not necessarily distinct. Then we form the product of these three sums. How many numbers between 1999 to 2021 can appear as such a product?

Answer：

15. Each side of an equilateral triangle is divided into 6 equal parts by 5 points, and these points are joined by lines parallel to the sides of the triangle, dividing into 36 small equilateral triangles. A regular hexagon is the same size as 6 of the small equilateral triangles put together. What is the maximum number of such hexagons that can along the grid line fit inside the large equilateral triangle without overlap?







Answer： ______, ______ hexagons