

# *International Mathematics Assessments for Schools*

## 2012 MIDDLE PRIMARY PRELIMINARY ROUND PAPER

Time allowed : 75 minutes

### **INSTRUCTION AND INFORMATION**

#### **GENERAL**

1. Do not open the booklet until told to do so by your teacher.
2. No calculators, slide rules, log tables, math stencils, mobile phones or other calculating aids are permitted. Scribbling paper, graph paper, ruler and compasses are permitted, but are not essential.
3. Diagrams are NOT drawn to scale. They are intended only as aids.
4. There are 20 multiple-choice questions, each with 5 choices. Choose the most reasonable answer. The last 5 questions require whole number answers between 000 and 999 inclusive. The questions generally get harder as you work through the paper. There is no penalty for an incorrect response.
5. This is a mathematics assessment, not a test; do not expect to answer all questions.
6. Read the instructions on the answer sheet carefully. Ensure your name, school name and school year are filled in. It is your responsibility that the Answer Sheet is correctly coded.
7. When your teacher gives the signal, begin working on the problems.

#### **THE ANSWER SHEET**

1. Use only lead pencils.
2. Record your answers on the reverse side of the Answer Sheet (not on the question paper) by FULLY filling in the circles which correspond to your choices.
3. Your Answer Sheet will be read by a machine. The machine will see all markings even if they are in the wrong places. So please be careful not to doodle or write anything extra on the Answer Sheet. If you want to change an answer or remove any marks, use a plastic eraser and be sure to remove all marks and smudges.

#### **INTEGRITY OF THE COMPETITION**

The IMAS reserves the right to re-examine students before deciding whether to grant official status to their scores.

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### Questions 1-10, 3 marks each

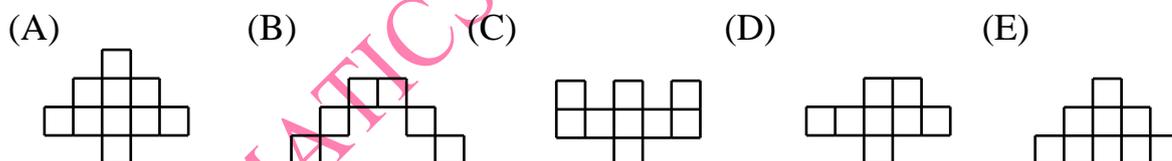
1. We want to cut a 20 m stick into shorter sticks of length 4 m. We can only cut one piece of stick at a time. How many cuts are required?  
(A) 3            (B) 4            (C) 5            (D) 6            (E) 7
- 

2. What number must replace the  $\square$  in the mathematical sentence  $\square + 5 = 13 - 6$  to make it correct?  
(A) 1            (B) 2            (C) 3            (D) 4            (E) 5
- 

3. Which of the following number is less than 2,010,000?  
(A) two millions ten thousands            (B) 2 100 000  
(C) one millions two thousands            (D) 20 100 000  
(E) two millions one hundred thousands
- 

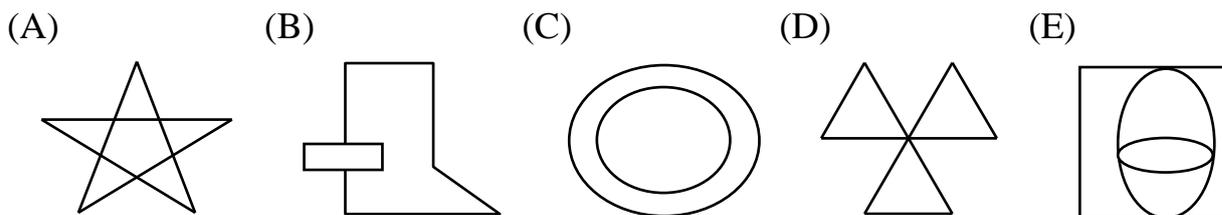
4. What is the value of  $999 + 99$ ?  
(A) 1088            (B) 1098            (C) 1099            (D) 1889            (E) 1989
- 

5. The following figures are formed by identical squares. Which figure has the largest perimeter?



6. Starting from the forest, a rabbit hopped 500 m to the north, and then reached a farm by hopping 500 m to the west. In which direction from the forest is the farm?  
(A) East    (B) South    (C) Northwest    (D) North    (E) West
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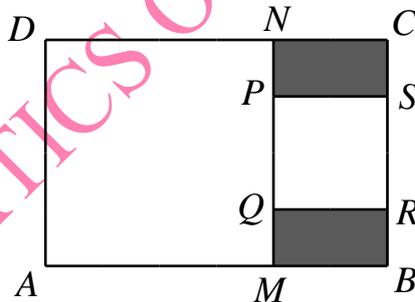
7. Which of the following figures can be drawn without lifting the pencil off the paper and without going over any line twice?



8. What operation signs must replace  $\bigcirc$  and  $\square$  so that the mathematical sentence  $2 + 8 + 3 = 2 \bigcirc 8 \square 3$  is correct?  
 (A) + for  $\bigcirc$  and  $\times$  for  $\square$  (B)  $\times$  for  $\bigcirc$  and  $-$  for  $\square$   
 (C) + for  $\bigcirc$  and  $\div$  for  $\square$  (D)  $\times$  for  $\bigcirc$  and  $\div$  for  $\square$   
 (E)  $\times$  for  $\bigcirc$  and + for  $\square$
9. A ray consists of a point on a line and all the points on that line on one side of that point. How many rays can we draw through a point on a plane?  
 (A) 1 (B) 2 (C) 4  
 (D) 8 (E) Infinity many
10. The birthdays of two sisters are on the same day. The elder sister is 4 years older than the younger sister. When the sum of their ages reaches 50 years, how old is the younger sister?  
 (A) 12 (B) 20 (C) 23 (D) 25 (E) 27

### Questions 11-20, 4 marks each

11. The diagram to the right shows two squares  $AMND$  and  $PQRS$  inside a rectangle  $ABCD$ . The areas of the two squares are  $16 \text{ cm}^2$  and  $4 \text{ cm}^2$  respectively. What is the sum of area of the shaded regions in  $\text{cm}^2$ ?



- (A) 3 (B) 4 (C) 5 (D) 6 (E) 7
12. How many zeroes are there in the end of the product of  $20 \times 30 \times 40 \times 50$ ?  
 (A) 1 (B) 2 (C) 4 (D) 5 (E) 6
13. Some students form a rectangle. Joseph is in the fourth row if we count from the front and in the seventh row if we count from the back. He is in the third column if we count from left and in the ninth column if we count from the right. How many students are there?  
 (A) 90 (B) 100 (C) 110 (D) 120 (E) 132

14. Two pieces of straw can be joined together by overlapping one with the other for a length of 2 cm. If three pieces of straw are joined together to form a magic wand, what is the length, in cm, of the magic wand?

- (A) 54      (B) 55      (C) 56      (D) 58      (E) 60

15. In the mathematical sentence below,  $A, B, C, D, E$  and  $F$  represent six distinct digits from 0 to 9. What is the numeral value of  $E$ ?

$$\begin{array}{r}
 6 \ A \\
 3 \ 5 \\
 \hline
 3 \ 3 \ B \\
 1 \ C \ 8 \\
 \hline
 D \ E \ F \ B
 \end{array}$$

- (A) 0      (B) 1      (C) 2      (D) 3      (E) 4

16. A soccer match consists of two halves each lasting 45 minutes, with a 15-minute break in between. If a soccer match begins at 13:00 and there is no extension of the game, at what time will it end?

- (A) 13 : 45      (B) 14 : 00      (C) 14 : 30      (D) 14 : 35      (E) 14 : 45

17. Study the mathematical sentences below:

$$74 \times 6 = 444,$$

$$74 \times 12 = 888,$$

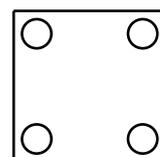
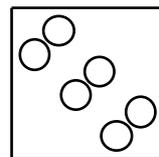
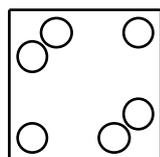
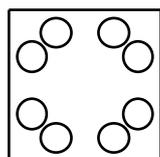
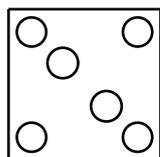
$$74 \times (\quad) = 444888$$

What number must be filled in the parenthesis so that the last sentence is correct?

- (A) 1266      (B) 1206      (C) 6088      (D) 6612      (E) 6012

18. Let us fold a square piece of paper along a diagonal to make a triangle. Cut a small round hole near each of the three corners of the triangle. Which of the following figures is obtained when we unfold the piece of paper?

- (A)      (B)      (C)      (D)      (E)





23. Let  $\triangle$ ,  $\square$  and  $\star$  represent three distinct digits. If  $7\triangle 90901$  is larger than  $79\square 9001$ , which is in turn larger than  $798900\star$ , what is the value of  $\triangle + \square + \star$ ?
- 
24. The number of bicycles in the school bicycles lot is a three-digit number, and the number of bicycle wheels is also a three-digit number. These six digits are 2, 3, 4, 5, 6 and 7 in some order. At most how many bicycles are there?
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25. Helen has some \$1, \$2 and \$5 coins. The total value is \$80. All the \$1 coins may be traded in for \$10 coins, resulting in 36 fewer coins. All the \$5 coins may be traded in for \$10 coins, and all the \$2 coins may be traded in for \$5 coins. What is the largest possible numbers of coins Helen has?
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