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# *International Mathematics Assessments for Schools*

## 2013 MIDDLE PRIMARY DIVISION FIRST 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.

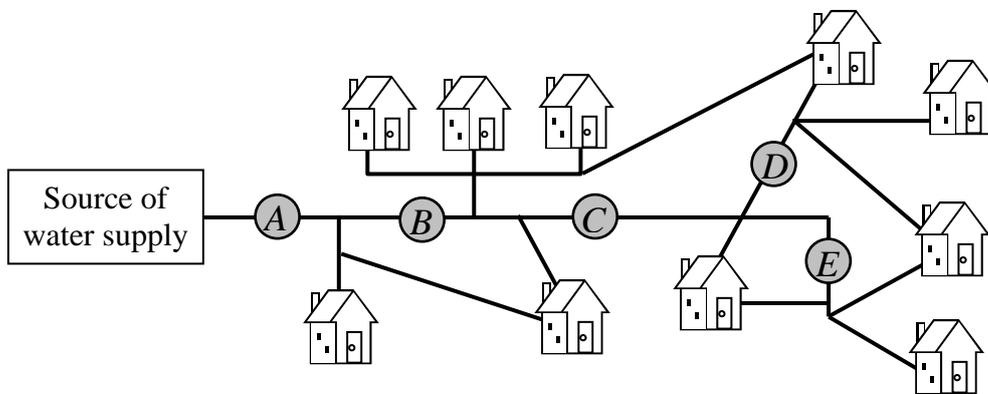
#### **INTEGRITY OF THE COMPETITION**

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



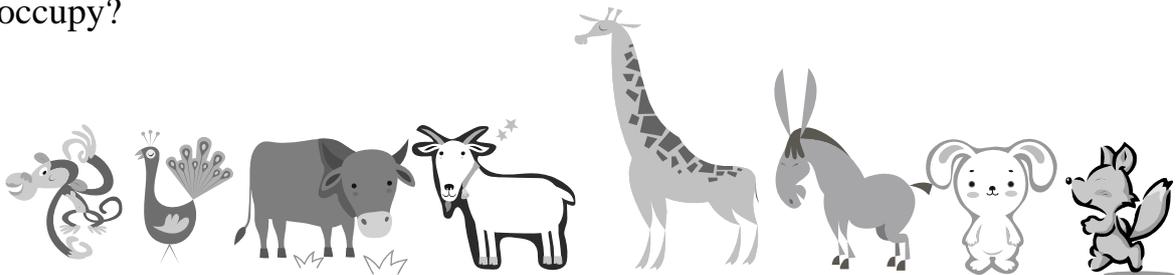
6. Walter has two options when going to school. He can (a) walk 8 minutes to the bus stop and then ride the bus for 15 minutes to the school, or (b) walk 10 minutes to the subway stop and then ride the subway for 10 minutes to school. If he does not have to wait for the bus at the bus stop, nor the train on the subway station, what is the minimum number of minutes required for him to get to school?  
 (A) 18                      (B) 20                      (C) 23                      (D) 25                      (E) 33

7. The diagram shows the water distribution system in the neighbourhood. There are five valves indicated by capital letters in black circles. When water flows into a house, it will not flow out of that house into another. Which valve must we close in order to shut off the water to exactly four houses?



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

8. A giraffe invites 28 small animals to a Plain Peach Party. In the group photo, the giraffe is in the middle. Counting from the left, which position does the giraffe occupy?



- (A) 12                      (B) 13                      (C) 14                      (D) 15                      (E) 16

9. A kangaroo jumps 6 metres forward, 4 metres backward, 7 metres forward, 8 metres backward and then rests. How many metres apart are the current position and the initial position of the kangaroo?



- (A) 1                      (B) 3                      (C) 4                      (D) 6                      (E) 8



15. Three rabbits are digging for parsnips in a field. The White Rabbit and the Spotted Rabbit dig up 13 parsnips between them. The Spotted Rabbit and the Black Rabbit dig up 11 parsnips between them. The Black Rabbit and the White Rabbit dig up 16 parsnips between them. What is the total number of parsnips dug up by the three of them?

(A) 10            (B) 11            (C) 15            (D) 16            (E) 20

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16. Three travellers are crossing a desert together. When Mickey has finished his water supply, Don still has 5 bottles of mineral water and Jan has 4 bottles. They share the water equally among them. Mickey pays the others 36 dollars for the water he has received. How many dollars should go to Don?

(A) 8            (B) 12            (C) 16            (D) 20            (E) 24

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17. From a box of chocolate, Mickey takes out half the number of pieces and puts one piece back. Then he takes out half of the remaining number of pieces and puts one piece back. After he has done this a total of 5 times, only three pieces are left in the box. How many pieces of chocolate are there in the box initially?



(A) 158            (B) 78            (C) 38            (D) 34            (E) 18

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18. A necklace consists of 27 beads. When the necklace is opened, the first two beads are black, the next two are white, the next two are black, the next two are white, as shown in the diagram. If this pattern continues, what is the total number of black beads in the necklace?



(A) 13            (B) 14            (C) 15            (D) 16            (E) 17

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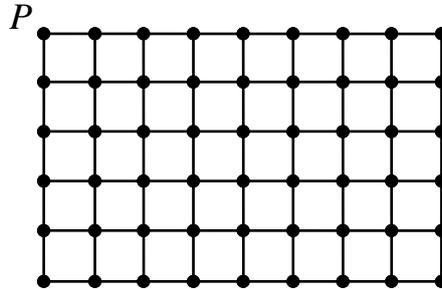
19. The digits 1 to 9 are placed inside the squares in the diagram, with a different digit in each of the boxes. Only the digit 2 is shown. If the equations are correct, what is the two-digit number formed by the digits in the first two boxes from the left?

$$\square \square \div \square \square = \square \square - \square \square = \square 2$$

(A) 98            (B) 86            (C) 78            (D) 76            (E) 68

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20. There are 54 grid points on the 5 by 8 grid, shown in the diagram, where the side of each small square is 1 cm. Starting from point  $P$ , an ant crawls from grid point to grid point along the grid lines, visiting each grid point exactly once before returning to  $P$ . What is the maximum length of its path, in cm?

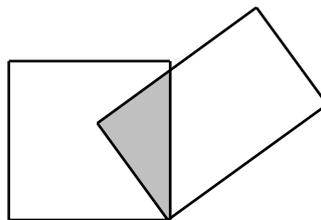


- (A) 26      (B) 30      (C) 36      (D) 54      (E) 93
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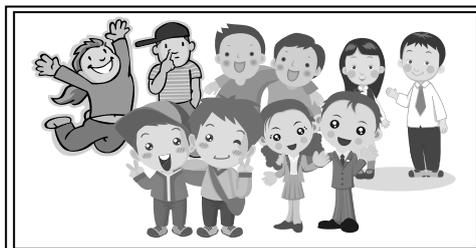
**Questions 21-25, 6 marks each**

21. Some cards are missing from a deck of 52 cards. If the incomplete deck is dealt to four players so that each receives the same number of cards, then 3 cards are left. If it is dealt to three players instead, with each still receiving the same number of cards, then 1 card is left. What is the maximum number of cards possible in the incomplete deck?

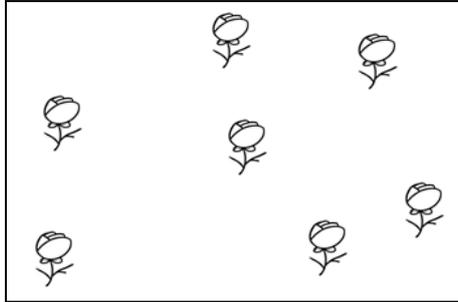
22. The diagram shows a 4 cm by 4 cm piece of paper overlapping a 3 cm by 5 cm piece of paper. By how many  $\text{cm}^2$  does the area of the non-overlapped part of the square piece of paper exceed the area of the non-overlapped part of the rectangular piece of paper?



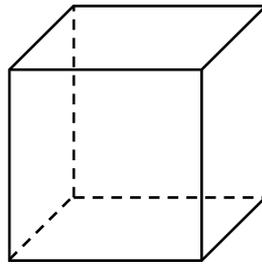
23. For the class photo of 42 students, the photo shop charges 10 dollars for the first copy and 3 dollars for each additional copy. Moreover, 2 bonus copies are given for any order over 30 copies. If each student gets one copy, how many dollars must they pay the photo shop altogether?



24. The diagram shows 7 flowers printed on a piece of paper. What is the smallest number of straight lines we must draw to divide the piece of paper into a number of regions, so that each flower is in a different region?



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25. The six faces of a cubical die are labelled with six different positive integers. If the numbers on any two adjacent faces differ by at least 2, what is the minimum value of the sum of these six numbers?



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