International Mathematics Assessments for Schools

2014 UPPER 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.

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Questions 1-10, 3 marks each

1. What is the value of 2015 + 1520 + 5201?

（A）8236　　（B）8506　　（C）8736

（D）8836　　（E）9716

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2. The three numbers in each of the following groups are multiplied together. Which group yields 2014 as the product?

（A）6、17、59　　（B）4、17、53　　（C）2、13、59

（D）2、19、53　　（E）2、23、29

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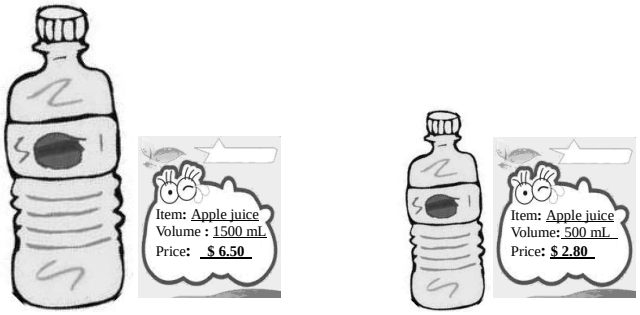
3. A large bottle of apple juice costs 6.5 dollars while a small bottle of apple juice costs 2.8 dollars. How many dollars less is the cost of a large bottle compared to the total cost of three small bottles?



（A）1.9　　（B）2.1　　（C）2.3　　（D）2.8　　（E）3.7

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4. Which of the following differences has the smallest value?

（A）$1-\frac{1}{2}$　　（B）$\frac{1}{2}-\frac{1}{3}$　　（C）$\frac{1}{3}-\frac{1}{4}$

（D）$\frac{1}{4}-\frac{1}{5}$　　（E）$\frac{1}{5}-\frac{1}{6}$

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5. The two stars in the diagram represent the same number. The sum of the three numbers in the second row is equal to twice the sum of the three numbers in the first row. What number does each star represent?

5	6	☆		
		☆	19	20

（A）7　　（B）8　　（C）13　　（D）17　　（E）18

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6. A sack of flour costs 800 dollars and a sack of rice costs 500 dollars. Anne buys several sacks of each kind and spends 3400 dollars. How many sacks of flour does she buy?

（A）1　（B）2　（C）3　（D）4　（E）5

7. When two numbers are divided by 5, the respective remainders are 4 and 2. What is the remainder when the sum of the two numbers is divided by 5?

（A）0　（B）1　（C）2　（D）3　（E）4

8. The numbers 38, 79, 17, 43, 74, 96 and 87 are rearranged so that starting from the second one, its tens digit is equal to the units digit of the preceding number. Which number is in the fourth place after the rearrangement?

（A）38　（B）43　（C）17　（D）96　（E）87

9. To visit a friend, Rod must take the bus to the nearest Metro station, and this takes 15 minutes. He has to ride the Metro train for 20 stops, each taking 2.5 minutes. He also has to change trains twice, and it takes 3 minutes each time. Finally, after exiting the Metro, he still has to walk another 12 minutes before reaching his friends place. How many minutes does Rod have to spend traveling to his friend's house?

（A）55　（B）67　（C）80　（D）83　（E）90

10. A table has 3 rows and 3 columns. In each square, we put in the product of the row number and the column number of that square. For instance, the number in the third row and the second column is 3×2=6, as shown in the diagram. These nine numbers are then arranged in order of size, starting with the smallest. What is the fifth number in the arrangement?

	6	

（A）2　（B）3　（C）4　（D）5　（E）6

Questions 11-20, 4 marks each

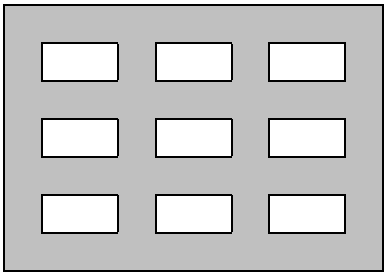
11. Oliver arranges his duck toy and turtle toy in a row as shown in the diagram. He desires that all duck toys to be on the left and all turtle toys on the right. He may switch the positions of any two adjacent toys. What is the minimum number of switches does he require to achieve his desired arrangement?

（A）15　（B）16　（C）17　（D）18　（E）19

12. The sum of one-fifth of a non-negative integer and one-third of another non-negative integer is 1. What is the maximum value of the sum of these two non-negative integers?

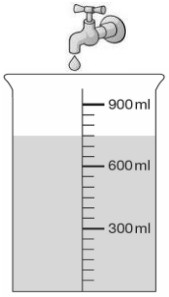
（A）5　（B）6　（C）7　（D）8　（E）9

13. Max has a gray paper strip of width 5 cm. He cuts out some pieces and tapes them on the wall, to form a 50 cm by 35 cm window frame, as shown in the diagram, where each white area is 5 cm by 10 cm. What is the minimum length, in cm, of the paper strip required?



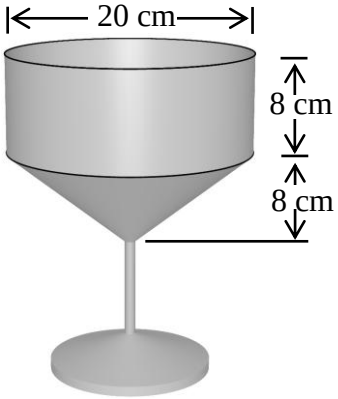
（A）260　（B）280　（C）300　（D）340　（E）360

14. The tap is leaking at the rate of one drop per second. The volume of each drop is 0.05 mL. At 9 pm, Wendy puts an empty measuring cup under the tap. Some time during the night, she finds the cup partially filled, as shown in the diagram. No water is lost from the cup. At what time is the water level in the measuring cup closest to the time in the following?



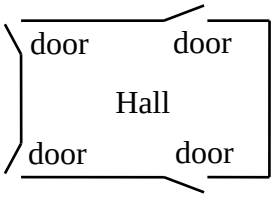
（A）23：10　（B）00：30　（C）01：10
（D）01：50　（E）02：10

15. The upper part of a glass is a cylinder of height 8cm and diameter 20 cm. The middle part is a cone of height 8 cm and diameter 20 cm. The bottom part is a solid stem. Correct to one decimal place, what is the capacity, in cm^3, of the cup? Take π=3.14.



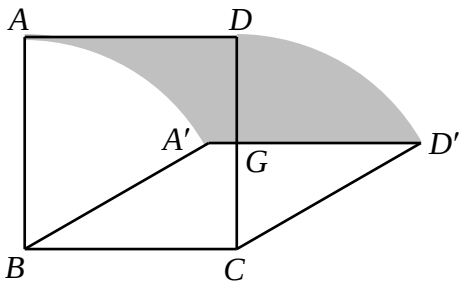
（A）837.3 cm^3　（B）1674.7 cm^3　（C）2512.0 cm^3
（D）3349.3 cm^3　（E）5024.0 cm^3

16. A hall has four doors. Lea may enter the hall using any of them, and exit the hall using any of them. In how many different ways can she enter and exit the hall?



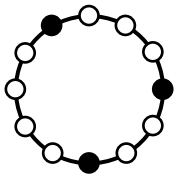
（A）4　（B）8　（C）12　（D）16　（E）24

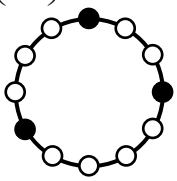
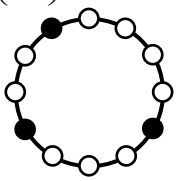
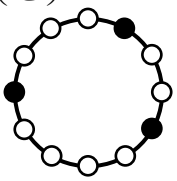
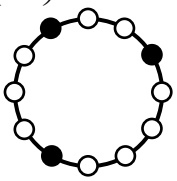
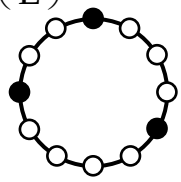
17. *ABCD* is a square of side length 10 cm. The segment *BC* is fixed. The segment *AD* moves in the plane to the segment *A′D′* so that the lengths *AB*, *DC* and *AD* do not change. What is the area, in cm^2, of the shaded region in the diagram when the segment *A′D′* intersects the segment *CD* at its midpoint *G*?



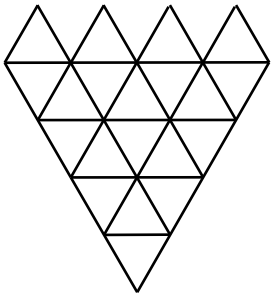
（A）50　（B）$\frac{50\pi}{3}$　（C）60　（D）100　（E）$\frac{100\pi}{3}$

18. On a table there is a ring, there are 12 equally spaced beads on the ring, 3 of which are black, as shown in the diagram. Which of the following five figures cannot be obtained from the given figure by rotating the ring on the table?



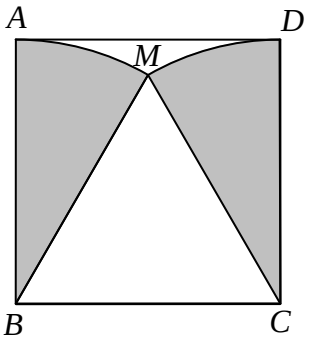
(A) 
(B) 
(C) 
(D) 
(E) 

19. The figure in the diagram is formed from 20 equilateral triangles of equal sizes. How many equilateral triangles of any size does it contain? The triangles may overlap.



(A) 20 (B) 26 (C) 30 (D) 33 (E) 39

20. The sectors *MAB* and *MCD* are inside the square *ABCD* of side length 10 cm, as shown in the diagram. What is the total area, in cm^2, of these two sectors, correct to 1 decimal place? Take π=3.14.



(A) 52.3 (B) 78.5 (C) 104.7 (D) 157.0 (E) 314.0

Questions 21-25, 6 marks each

21. In the sequence 1, 1, 2, 3, 5, 8, 13, 21, ⋯, each term starting from the third one is the sum of the preceding two. How many among the first 2014 terms are divisible by 4?

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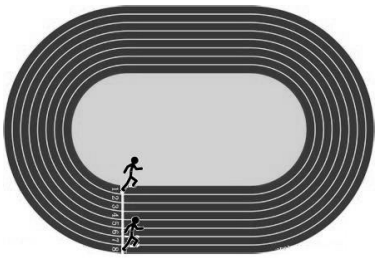
22. The inside lane of a track has length 400 m and the outside lane has length less than 500 m. From the marked line, as shown in the diagram, Max and Lynn start running counterclockwise along the track at the same time. Max runs at constant speed on the inside lane. Lynn, whose constant speed is 3 times that of Max, runs on the outside lane. The first time both are back together at the marked line, Max has completed 3 laps. What is the length, to the nearest m, of the outside lane?



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23. How many two-digit prime numbers are there if the three-digit number obtained by inserting a 1 between the two digits is also a prime number?

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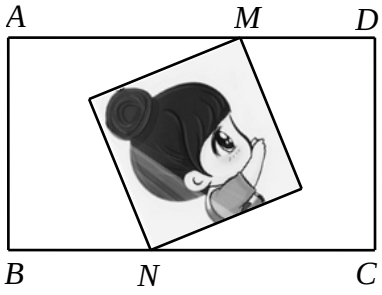
24. An 8 cm by 8 cm photograph is loose inside an 18 cm by 10 cm frame *ABCD*. However, the point *M* remains on *AD* and the point *N* remains on *BC*, as shown in the diagram. What is the area, in cm^2, of the region inside the frame which is never covered by the photograph?



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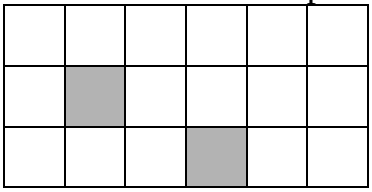
25. How many pairs of unit squares in a 3 by 6 table are such that they have no common points? The diagram shows one such pair.



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