



*Kangourou Sans Frontières*



*Math Kangaroo in USA*

# Math Kangaroo 2018 in USA

International Competition in Mathematics

Thursday, March 15, 2018

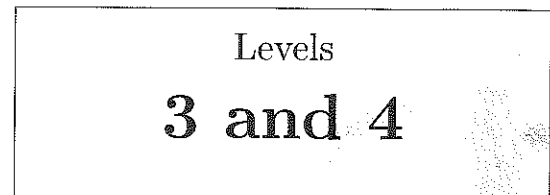
This test consists of 24 questions on 4 pages.

You have 75 minutes to complete it.

Calculators are not allowed.

Please enter your answers on the answer form provided.

Please put your name and ID number on the line below.



Problems 3 points each

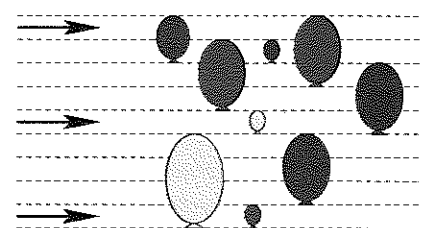
# 1. Lena has 10 rubber stamps. Each stamp has one of the digits: 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9. She stamps the date of the Kangaroo contest:

0
3
1
5
2
0
1
8

How many of the stamps does she use?

- (A) 5                      (B) 6                      (C) 7                      (D) 9                      (E) 10

# 2. The picture shows 3 arrows that are flying and 9 balloons that can't move. When an arrow hits a balloon, the balloon pops, and the arrow keeps flying in the same direction. How many balloons will be hit by the flying arrows?



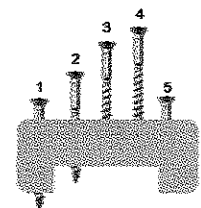
- (A) 2                      (B) 3                      (C) 4                      (D) 5                      (E) 6


# 3. Susan is 6 years old. Her sister is one year younger and her brother is one year older. What is the sum of the ages of the three siblings?






- (A) 10                      (B) 15                      (C) 18                      (D) 21                      (E) 30

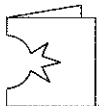
# 4. The picture shows five screws in a block. Four of the screws are the same length. One screw is shorter. Which screw is the short one?


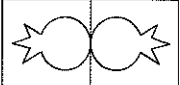
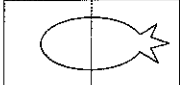
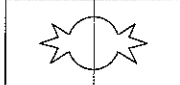
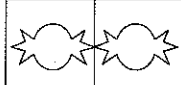
- (A) 1                      (B) 2                      (C) 3                      (D) 4                      (E) 5



# 5. Here is Sophie the ladybug . She turns around. Which of the ladybugs below is not Sophie?

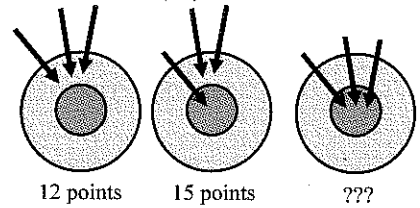
- (A)  (B)  (C)  (D)  (E) 

# 6. Lucy folds a sheet of paper in half. Then she cuts a piece out of it as shown here: . What will she see when she unfolds the paper?

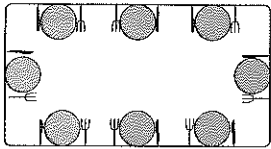
- (A)  (B)  (C)  (D)  (E) 

# 7. On her first turn, Diana scored 12 points total with three arrows. On her second turn she scored 15 points. How many points did she score on her third turn?

- (A) 18 (B) 19 (C) 20 (D) 21 (E) 22




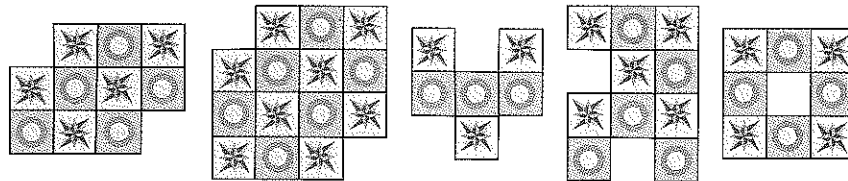
# 8. Mike sets the table for 8 people. He must set the table correctly for each person sitting at the table. Setting the table correctly means that the fork is on the left of the plate and the knife is on the right of the plate. For how many people did Mike set the table correctly?








- (A) 5 (B) 4 (C) 6 (D) 2 (E) 3






Problems 4 points each

# 9. Roberto makes designs using tiles like this . How many of the 5 designs is it possible to make?



- (A) 1 (B) 2 (C) 3 (D) 4 (E) 5

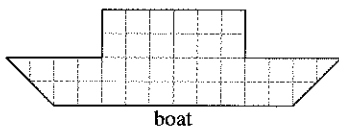
# 10. Albert fills the grid with these five figures: , , , , and . Each figure appears exactly once in every column and every row. Which figure must Albert put in the cell with the question mark?

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

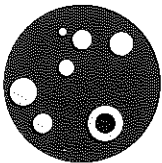
			?	

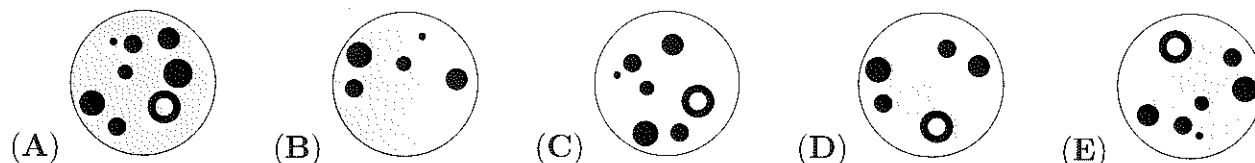


# 11. Tom cuts two kinds of shapes out of grid paper as shown to the left. What is the smallest number of shapes that Tom needs in order to exactly cover the boat in the picture?



- (A) 5 (B) 6 (C) 7 (D) 8 (E) 9

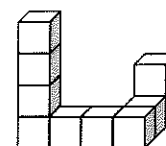
# 12. The colors in this picture  are switched. Then the picture is rotated. What does the picture look like now?



# 13. Peta Rabbit has 20 carrots. She eats 2 carrots every day. She ate the 12th carrot on Wednesday. On which day did she start eating the carrots?

- (A) Monday (B) Tuesday (C) Wednesday (D) Thursday (E) Friday

# 14. Toby glues 10 cubes together to make the structure shown to the right. He paints the whole structure, even the bottom. How many cubes are painted on exactly 4 of their faces?

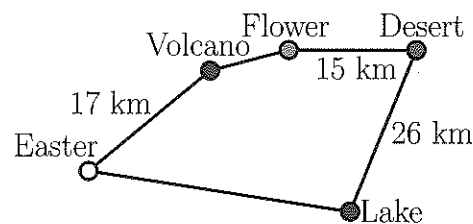


- (A) 6 (B) 7 (C) 8 (D) 9 (E) 10

# 15. There are 8 flowers on a rose bush. Some butterflies and some dragonflies are sitting on the flowers. There is no more than one insect on each flower. More than half of the flowers have an insect on them. The number of butterflies on the flowers is twice the number of dragonflies on the flowers. How many butterflies are sitting on the flowers?

- (A) 2 (B) 3 (C) 4 (D) 5 (E) 6

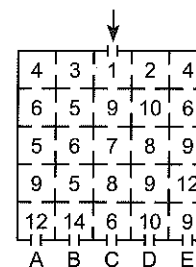
# 16. Captain Kook wants to sail from the island called Easter through every island on the map and back to Easter. The total journey is 100 kilometers (km) long. The direct distance between Desert and Lake is the same as the distance between Easter and Flower via Volcano. How far is it directly from Easter to Lake?



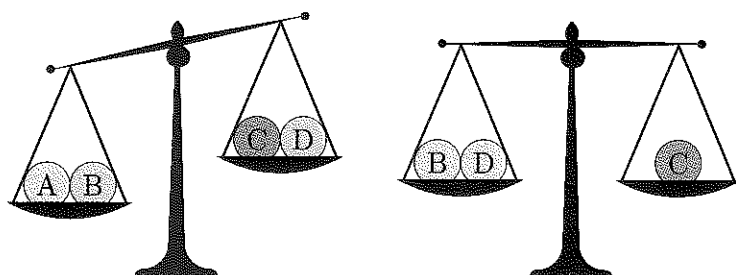
- (A) 17 km (B) 23 km (C) 26 km (D) 33 km (E) 35 km

Problems 5 points each

# 17. The rooms in Kanga's house are numbered. Baby Roo enters the main door, passes through some rooms and leaves the house. The numbers on the rooms that he visits are always increasing. Through which door does he leave the house?



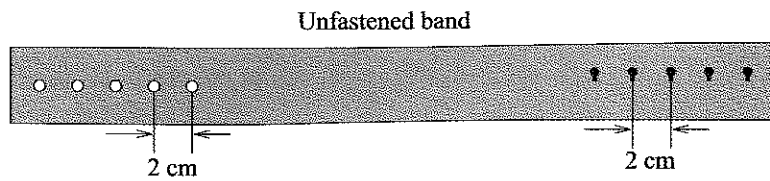
- (A) A (B) B (C) C (D) D (E) E



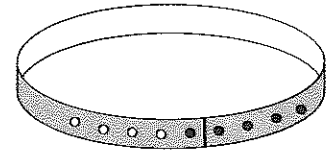
# 18. Four balls each weigh 10 g, 20 g, 30 g, and 40 g. Which ball weighs 30 g?

- (A) A (B) B (C) C (D) D  
(E) it could be A or B

# 19. The band shown in the drawing can be fastened in five ways. How much longer is the band fastened in one hole than the band fastened in all five holes?



Band fastened in one hole



- (A) 4 cm      (B) 8 cm      (C) 10 cm      (D) 16 cm      (E) 20 cm

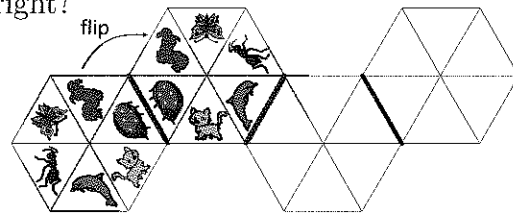
# 20. In an ancient language the symbols     represent the following numbers: 1, 2, 3, 4, and 5. Nobody knows which symbol represents which number.






We know that:  $\text{atom} + \text{atom} = \text{fish}$        $\text{sun} + \text{sun} = \text{atom}$        $\text{sun} + \text{fish} = \text{fish}$

Which symbol represents the number 3?

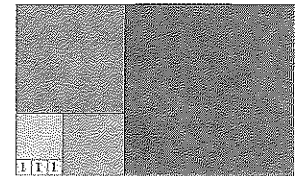
- (A)       (B)       (C)       (D)       (E) 

# 21. The hexagonal stained glass tile is flipped. One of the flips is shown. What does the stained glass tile look like at the far right?



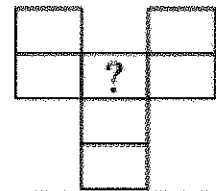
- (A)       (B)       (C)       (D)       (E) 

# 22. The large rectangle is made up of a number of squares of various sizes. The 3 small squares each have an area of 1. What is the area of the large rectangle?



- (A) 165      (B) 176      (C) 187      (D) 198      (E) 200

# 23. Leon wants to write the numbers from 1 to 7 in the grid shown. Two consecutive numbers cannot be written in two neighboring cells. Neighboring cells are those that meet at the edge or at a corner. What numbers can he write in the cell marked with the question mark?



- (A) all seven numbers      (B) all of the odd numbers  
 (C) all of the even numbers      (D) only the number 4  
 (E) only the numbers 1 or 7

# 24. To defeat a dragon, Matthias has to cut off all the dragon's heads. If he can cut off 3 of the dragon's heads, one new head immediately grows. Matthias defeats the dragon by cutting off 13 heads in total. How many heads did the dragon have at the beginning?

- (A) 8      (B) 9      (C) 10      (D) 11      (E) 12