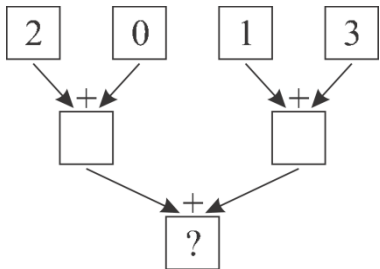# International Contest-Game
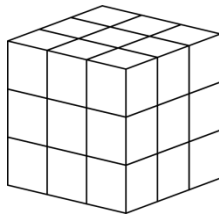# MATH KANGAROO

Part A: Each correct answer is worth 3 points.

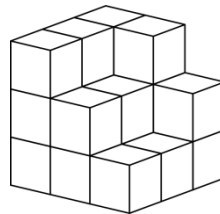1. We put 2, 0, 1, 3 into an adding machine, as shown.

    What is the result in the box with the question mark?
    (A) 2　　　　　(B) 3　　　　　(C) 4　　　　　(D) 5　　　　　(E) 6

2. Nathalie wanted to build the same cube as Diana had (see the picture).


    Diana's cube　　　　　　　　　　Nathalie's cube

    However, Nathalie ran out of small cubes and built only the part of the cube, as you can see in the picture. How many more small cubes did Nathalie need to complete her cube?

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

3. The diagram is a scale rerpresentation of the distance between Mara's house and the house of her friend Bunica. One half, one quarter and one eighth of the distance are marked on the diagram.
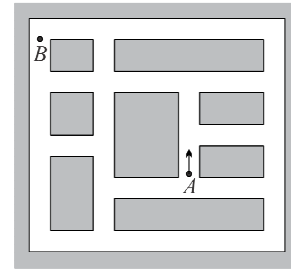
    What is the real distance between the two houses?
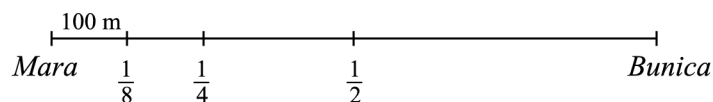
    (A) 300 m　　　　(B) 400 m　　　　(C) 800 m　　　　(D) 1 km　　　　(E) 700 m

4. Nick is learning to drive on the training ground shown on the figure. He knows how to turn right but cannot turn left. What is the smallest number of turns he must make in order to get from point A to point B, starting in the direction of the arrow?

(A) 3   (B) 4   (C) 6

(D) 8   (E) 10

5. The total of the ages of Ann, Bob and Chris is 31 years. What will the total of their ages be in three years time?

(A) 32   (B) 34   (C) 35   (D) 37   (E) 40

6. The Gurukans have three little daughters. Every daughter has exactly two brothers. How many people are there in the family?
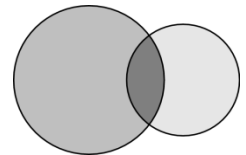
(A) 5   (B) 7   (C) 8   (D) 9   (E) 11

7. Michael has to take a pill every 15 minutes. He took the first pill at 11:05. At what time did he take the fourth pill?

(A) 11:40   (B) 11:50   (C) 11:55   (D) 12:00   (E) 12:05

8. By drawing two circles, Mike obtained a figure, which consists of three regions (see picture). At most how many regions could he obtain by drawing two squares?

(A) 3   (B) 5   (C) 6   (D) 8   (E) 9

9. The number 36 has the property that it is divisible by the digit in the unit position, because 36 is divisible by 6. The number 38 does not have this property. How many numbers between 20 and 30 have this property?
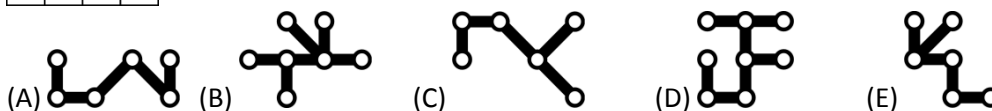
(A) 2   (B) 3   (C) 4   (D) 5   (E) 6
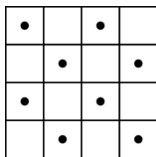
10. The incorrect equality statement $1 + 3 + 6 \times 2 = 22$ may be made correct by increasing one of the numbers in it by 1. Which number should it be?
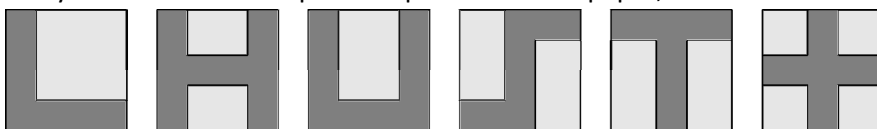
(A) 1   (B) 3   (C) 6   (D) 2   (E) 22

Part B: Each correct answer is worth 4 points.

11. Which of the following pieces covers the largest number of dots in the table?

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

12. Mary shades various shapes on square sheets of paper, as shown.
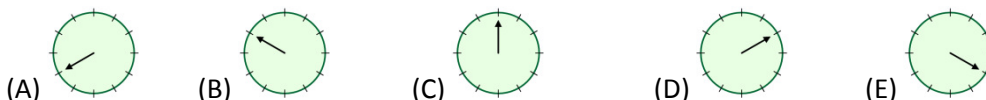

How many of these shapes have the same perimeter as the sheet of paper itself?

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

13. Ann rides her bicycle throughout the afternoon with constant speed. At the beginning and at the end of the route, her watch shows the time, as in the diagram:

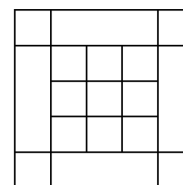Which picture shows the position of the minute hand when Ann finishes one third of the ride?

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

14. Matthew is catching fish. If he had caught three times as many as he actually did, he would have 12 more. How many fish did he catch?

(A) 7   (B) 6   (C) 5   (D) 4   (E) 3

15. How many different squares of any size can you identify in the picture?

(A) 27   (B) 25   (C) 15   (D) 19   (E) 23

16. Max, David and Peter competed in an ice cream eating contest. Max ate 6 scoops in the same time as David ate 4 scoops and Peter ate 5 scoops. Max ate 18 scoops in half an hour. How many scoops in total did they eat in half an hour together?

(A) 27   (B) 30   (C) 33   (D) 45   (E) 51

17. From a wooden cube with side 3cm we cut out at the corner a little cube with side 1cm (see picture). What is the number of faces of the solid after cutting out such a small cube at each corner of the big cube?

(A) 16   (B) 20   (C) 24   (D) 30   (E) 36
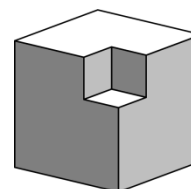
18. How many pairs of two-digit natural numbers have a difference equal to 50?

(A) 40   (B) 30   (C) 50   (D) 60   (E) 10

19. During the final game of a soccer championship the teams scored a lot of goals. Six goals were scored during the first period of the game and the guest team was leading the score at the halftime break. During the second period, the home team scored 3 goals and as a result, they won the game. How many goals did the home team score altogether?

(A) 3   (B) 4   (C) 5   (D) 6   (E) 7

3			

20. In the squares of the 4 x 4 board numbers are written such that the numbers in adjacent squares differ by 1. Numbers 3 and 9 appear in the table. Number 3 is in the top left corner as shown. How many different numbers appear in the table?

(A) 4 (B) 5 (C) 6 (D) 7 (E) 8

Part C: Each correct answer is worth 5 points.

21. Aron, Bern and Carl always lie. Each of them owns one stone, either a red stone or a green stone.
Aron says: "My stone is the same color as Bern's stone."
Bern says: "My stone is the same color as Carl's stone."
Carl says: "Exactly two of us own red stones."
Which of the following statements is true?

(A) Aron's stone is green.　　　(B) Bern's stone is green.　　　(C) Carl's stone is red.
(D) Aron's stone and Carl's stone have different colors　　　(E) None of A, B, C or D is true.

22. Sixty six cats signed up for the contest MISS CAT 2013. After the first round 21 cats were eliminated because they failed to catch a mouse. Of the remaining cats, 27 had stripes and 32 had one black ear. All striped cats with one black ear got to the final. What is the minimum number of finalists?

(A) 5 (B) 7 (C) 13 (D) 14 (E) 27

23. There are four buttons in a row as shown below. Two of them show happy faces, and two of them show sad faces. If we press on a face, its expression turns to the opposite (e.g. a happy face turns into a sad face after the touch). In addition to this, the adjacent buttons also change their expressions. What is the least number of times you need to press a button in order to get all happy faces?

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

24. 40 boys and 28 girls stand in a circle, hand in hand, all facing inwards. Exactly 18 boys give their right hand to a girl. How many boys give their left hand to a girl?

(A) 18 (B) 9 (C) 28 (D) 14 (E) 20

25. A stack of loads must be transported. If Ann does the job alone, it will take one hour. If Ben does the job alone, it will take two hours. How long will it take if Ann and Ben do the job together?

(A) 30 minutes (B) 40 minutes (C) 1 hour (D) 1.5 hours (E) 3 hours

26. How many 3-digit numbers possess the following property: after subtracting 297 from such a number, we get a 3-digit number consisting of the same digits in the reverse order?

(A) 6   (B) 7   (C) 10   (D) 60   (E) 70

27. When Pinocchio lies, his nose gets 8 cm longer. When he says the truth, the nose gets 3 cm shorter. When his nose was 7 cm long, he said five sentences and after that his nose got 25 cm long. How many of Pinocchio's sentences were true?

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

28. There were 2013 inhabitants on an island. Some of them were knights and the others were liars. The knights always tell the truth and the liars always lie. Every day, one of the inhabitants said: "After my departure the number of knights on the island will equal the number of liars" and then left the island. After 2013 days, there is nobody on the island. How many liars were there initially?

(A) 0   (B) 1006   (C) 1007   (D) 2013
(E) It is impossible to determine.

29. Starting with a list of three numbers, the "changesum" procedure creates a new list by replacing each number by the sum of the other two. For example, from $\{3, 4, 6\}$ the procedure "changesum" gives $\{10, 9, 7\}$ and a new "changesum" leads to $\{16, 17, 19\}$. If we begin with the list $\{20, 1, 3\}$, what is the maximum difference between two numbers of the list after 2013 consecutive "changesums"?

(A) 1   (B) 2   (C) 17   (D) 19   (E) 2013

30. Alice forms four identical numbered cubes using the net shown.
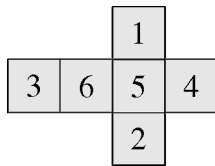
She then glues them together to form a $2{\times}2{\times}1$ block, as shown. Only faces with identical numbers are glued together.
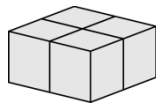
Alice then finds the total of all the numbers on the surface of the block.
What is the largest total that Alice can get?

(A) 66   (B) 68   (C) 72   (D) 74   (E) 76