



# Singapore Math Kangaroo Contest 2018

## Primary 6 / Grade 6 Contest Paper

Name: \_\_\_\_\_

School: \_\_\_\_\_

### INSTRUCTIONS:

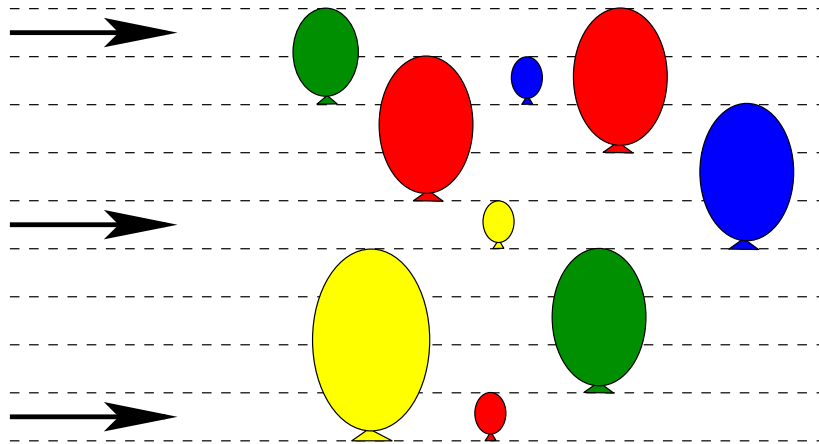
1. Please **DO NOT OPEN** the contest booklet until the Proctor has given permission to start.
2. **Duration: 1 hour and 30 minutes**
3. There are 30 questions in this paper. Each question scores 3 points in Section A, 4 points in Section B and 5 points in Section C. No points are deducted for Unanswered question. 1 point is deducted for Wrong answer.
4. Shade your answers neatly in the answer entry sheet.
5. PROCTORING: No help should be given to any student in any way during the contest.
6. **No calculators** are allowed.
7. All students must fill and shade in your **Name, Index number, Level and School** in the Answer sheet provided.
8. Students are not allowed to leave the venue within the first hour of the contest and 15 minutes before the end of the contest.
9. Students must show detailed working and transfer their answers to the answer entry sheet.
10. No spare papers can be used in writing this contest. Enough space is provided for your working of each question.
11. Students are not allowed take any answer script, reference materials and contest paper out of the venue.

# **Rough Working**

**Section A** (Correct – 3 points | Unanswered – 0 points | Wrong – deduct 1 point)

**Question 1**

The drawing shows 3 flying arrows and 9 fixed balloons. When an arrow hits a balloon, it bursts, and the arrow flies further in the same direction. How many balloons will not be hit by arrows?



(A) 3

(B) 2

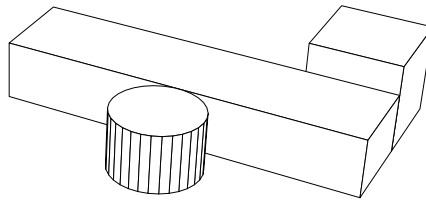
(C) 6

(D) 5

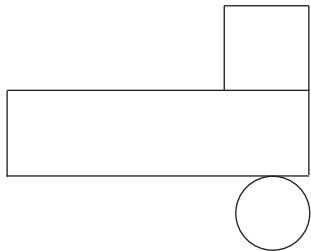
(E) 4

**Question 2**

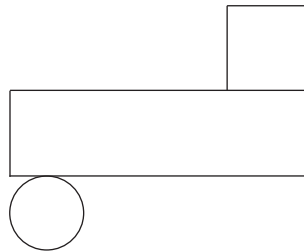
There are three objects on the table.



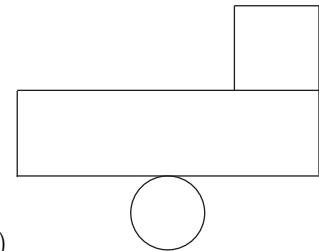
What does Peter see if he looks at the table from above?



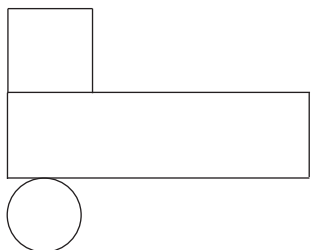
(A)



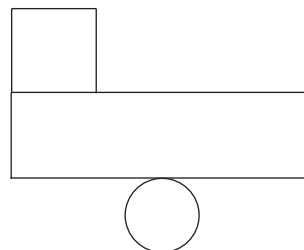
(B)



(C)



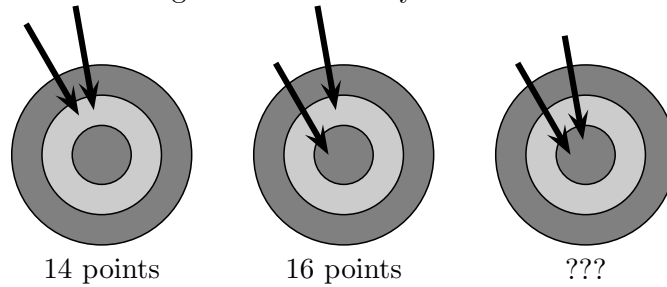
(D)



(E)

**Question 3**

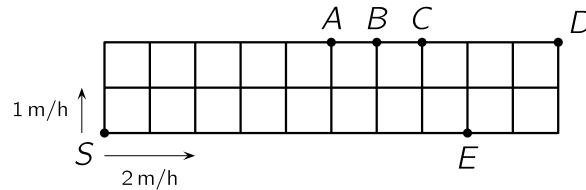
In the first try, Diana obtained 14 points with two arrows on the target. In the second try, she obtained 16 points. How many points did she get in her third try?



- (A) 17                      (B) 18                      (C) 19                      (D) 20  
(E) 22

**Question 4**

A garden is divided into identical squares. A fast and a slow snail move along the perimeter of the garden starting from the corner S but in different directions. The slow snail moves at 1 meter per hour (1 m/h) and the faster snail moves at 2 meters per hour (2 m/h). At what point will the two snails meet?



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

**Question 5**

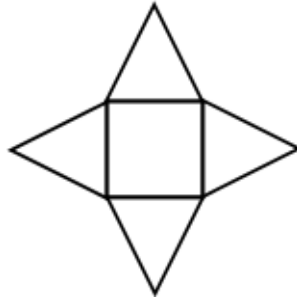
Alice subtracted two 2-digit numbers. Then she painted two boxes. What is the sum of the two digits in the painted boxes?

$$\begin{array}{|c|c|c|c|c|c|c|c|} \hline \color{red}{\blacksquare} & 3 & - & 2 & \color{red}{\blacksquare} & = & 2 & 5 \\ \hline \end{array}$$

- (A) 8                      (B) 9                      (C) 12                      (D) 13                      (E) 15

**Question 6**

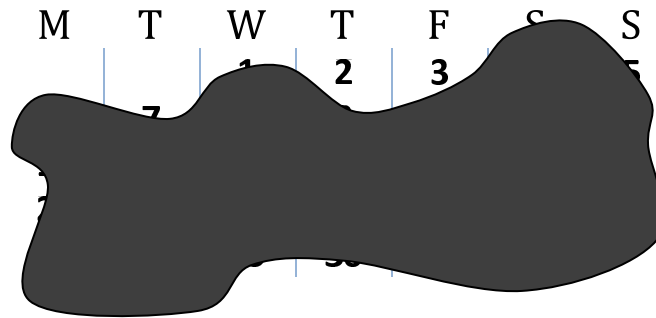
A figure below is made of four equilateral triangles and a square. The perimeter of the square is 36 cm. What is the perimeter of the figure below?



- (A) 144 cm      (B) 120 cm      (C) 104 cm      (D) 90 cm      (E) 72 cm

**Question 7**

The picture shows the calendar of a certain month. Unfortunately an ink spot covers most of the dates. What day is the 25th of that month?



- (A) Monday      (B) Wednesday      (C) Thursday      (D) Saturday      (E) Sunday

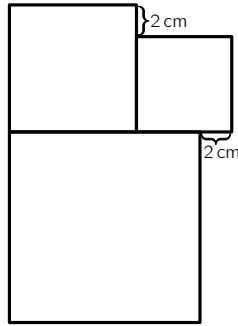
**Question 8**

What is the least number of times we have to roll a regular die to be sure that at least one number will be repeated? (Die is the singular form of dice.)

- (A) 5                      (B) 6                      (C) 7                      (D) 12  
(E) 18

**Question 9**

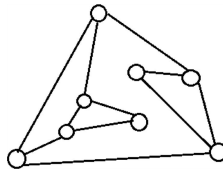
The figure is made up of 3 squares as shown below. The side length of the smallest square is 6 cm. What is the side length of the biggest square?



- (A) 8                      (B) 10                      (C) 12                      (D) 14                      (E) 16

**Question 10**

In the following figure, the circles are light bulbs connected to some other light bulbs. Initially, all light bulbs are off. When you touch a light bulb, this light bulb and all its neighbours are lit. At least how many light bulbs do you have to touch so that all the light bulbs are lit?

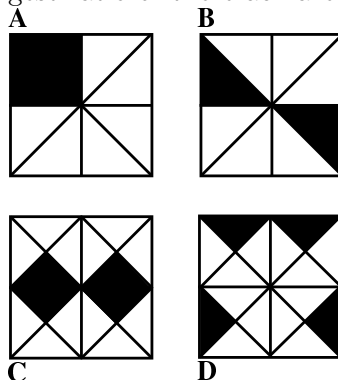


- (A) 2                      (B) 3                      (C) 4                      (D) 5                      (E) 6

**Section B** (Correct – 4 points | Unanswered – 0 points | Wrong – deduct 1 point)

**Question 11**

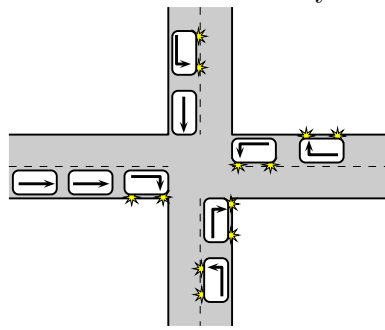
Which of the four squares has the largest ratio of the black area to the area of the whole square?



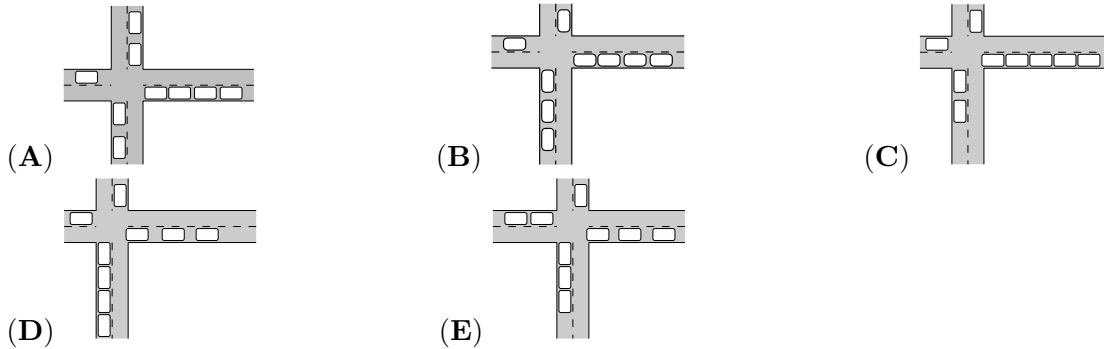
- (A) A                      (B) B                      (C) C                      (D) D                      (E) They are all the same

**Question 12**

Nine cars arrive at a crossroads and drive off as indicated by the arrows.

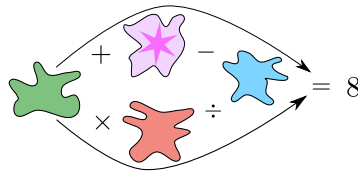


Which figure shows these cars after leaving the crossroads?



**Question 13**

Each of the spots covers one of the numbers 1, 2, 3, 4 or 5 so that both of the calculations following the arrows are correct. What is the number between the plus sign and minus sign?



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

**Question 14**

A lion is behind one of the three doors. A sentence is written on each door but only one of the three sentences is true.

Door 1: The lion is not behind this door.

Door 2: The lion is behind this door.

Door 3: The sum of two and three is five.

Which door is the lion behind?

- (A) Door 1                      (B) Door 2                      (C) Door 3  
 (D) All three doors are possible    (E) Both door 1 and door 2 are possible

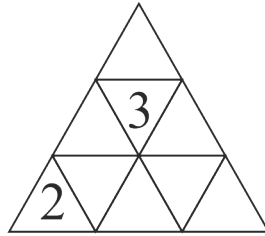
**Question 15**

Two girls, Eva and Olga and three boys, Adam, Isaac and Urban play with a ball. When a girl has the ball, she throws it to the other girl or to a boy. When a boy has the ball, he throws it to another boy but never to the boy from whom he just received it. Eva starts by throwing the ball to Adam. Who will make the fifth throw?

- (A) Adam            (B) Eva            (C) Isaac            (D) Olga            (E) Urban

**Question 16**

Emily wants to enter a number into each cell of the triangular table. The sum of the numbers in any two cells with a common edge must be the same. She has already entered two numbers. What is the sum of all the numbers in the table?



- (A) 18                            (B) 20                            (C) 21                            (D) 22  
 (E) Impossible to determine

**Question 17**

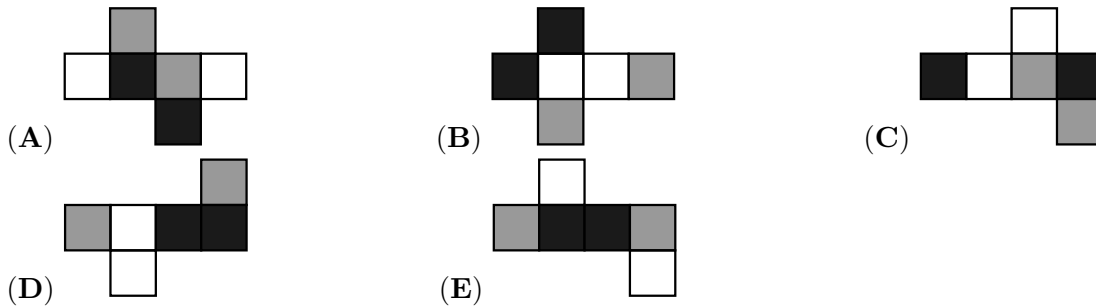
On Monday Alexandra shares a picture with 5 friends. For several days everybody who receives the picture, sends it the next day to two friends who haven't seen the picture yet. On which day does the number of people who have seen the picture becomes greater than 100?

- (A) Wednesday    (B) Thursday    (C) Friday    (D) Saturday    (E) Sunday



**Question 18**

The faces of a cube are painted black, white or grey so that opposite faces are of different colour. Which of the following is a possible net of this cube?



**Question 19**

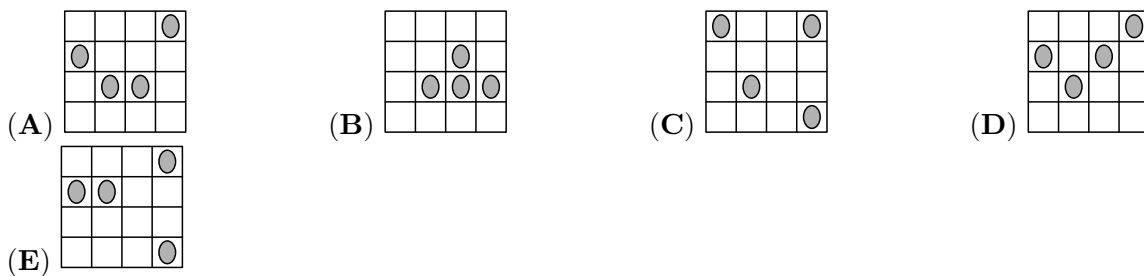
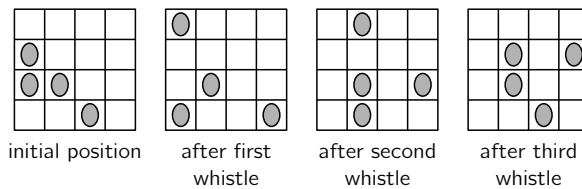
John does a calculation using the digits  $A$ ,  $B$ ,  $C$  and  $D$ . Which digit is represented by  $B$ ?

$$\begin{array}{r} ABC \\ + CBA \\ \hline DDDD \end{array}$$

- (A) 0                      (B) 2                      (C) 4                      (D) 5                      (E) 6

**Question 20**

Four ladybugs sit on different cells of a 4x4 grid. One of them is sleeping and does not move. Each time you whistle, the other 3 ladybugs move to a free neighbouring square. They can move up, down, right or left but they are not allowed to go back to the square that they just came from. Which of the following images might show the result after the fourth whistle?



**Section C** (Correct – 5 points | Unanswered – 0 points | Wrong – deduct 1 point)

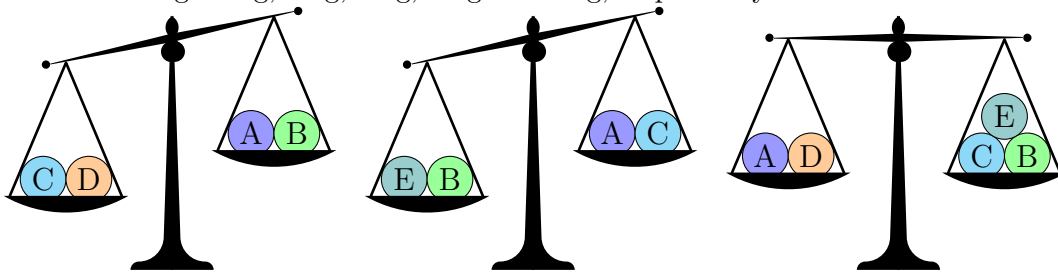
**Question 21**

From the list 3, 5, 2, 6, 1, 4, 7 Masha chose 3 numbers whose sum is 8. From the same list Dasha chose 3 numbers whose sum is 7. How many common numbers have been chosen by both girls?

- (A) none                      (B) 1                      (C) 2                      (D) 3  
 (E) impossible to determine

**Question 22**

Five balls weigh 30 g, 50 g, 50 g, 50 g and 80 g, respectively.



Which ball weighs 30 g?

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

**Question 23**

If A, B, C are distinct digits, then the largest possible 6-digit number written using the digit A 3 times, the digit B 2 times, and the digit C 1 time cannot be equal to

- (A) AAABBC              (B) CAAABB              (C) BBAAAC              (D) AAABCB              (E) AAACBB

**Question 24**

The sum of the ages of Kate and her mother is 36, and the sum of the ages of her mother and her granny is 81. How old was her granny when Kate was born?

- (A) 28                      (B) 38                      (C) 45                      (D) 53                      (E) 56

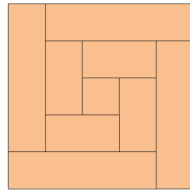
**Question 25**

Nick wants to arrange the numbers 2, 3, 4, ..., 10 into several groups such that the sum of the numbers in each group is the same. What is the largest number of groups he can get?

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

**Question 26**

Peter saw an 8 cm wide wooden shelf into 9 parts. One piece was a square and the rest were rectangles. Then he put all the pieces together as shown in the picture. What is the length of the shelf?



- (A) 150 cm                      (B) 168 cm                      (C) 196 cm                      (D) 200 cm                      (E) 232 cm

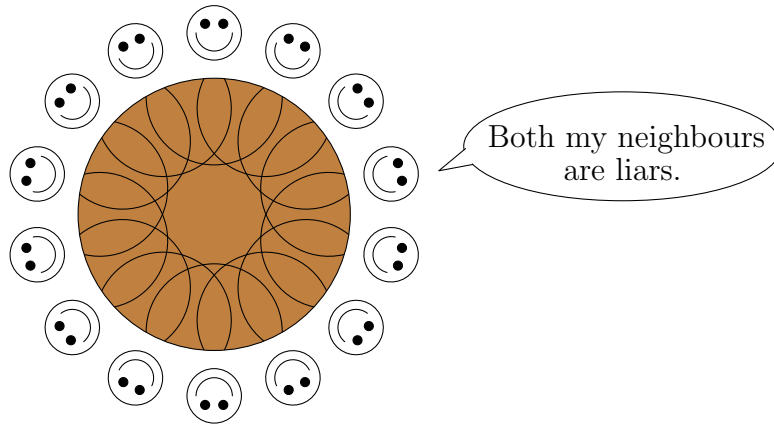
**Question 27**

Write 0 or 1 in each square of the 5x5 table such that each 2x2 square of the 5x5 table contains exactly 3 equal numbers. What is the largest possible sum of all the numbers in the table?


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

**Question 28**

14 people are seated at a round table. Each person is either a liar or tells the truth.

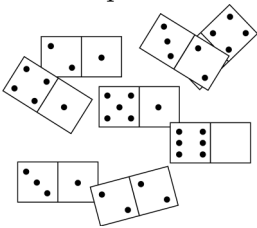


Everybody says: "Both my neighbours are liars". What is the maximum number of liars at the table?

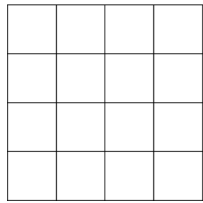
- (A) 7                      (B) 8                      (C) 9                      (D) 10                      (E) 14

**Question 29**

There are eight domino tiles on the table (pic 1). One of the domino tiles have been covered by half of another domino tile as shown in the picture below. The 8 tiles can be arranged into a 4x4 square (pic 2), so that the number of dots in each row and column are the same. How many dots are on the covered part of the domino tile?



pic 1

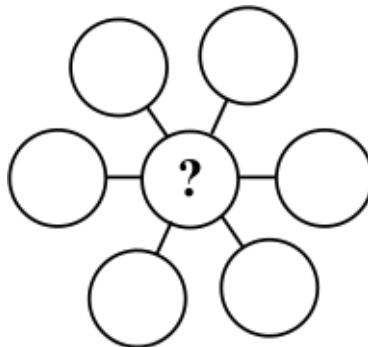


pic 2

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

**Question 30**

Write the numbers 3, 4, 5, 6, 7, 8 and 9 in the seven circles to obtain equal sums along each of the three lines. What is the sum of all the possible numbers that can fill the circle with the question mark?



- (A) 3                      (B) 6                      (C) 9                      (D) 12                      (E) 18

# **Rough Working**

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