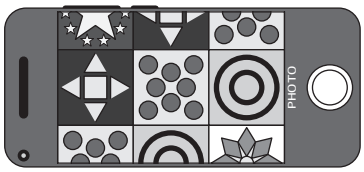
Benjamin

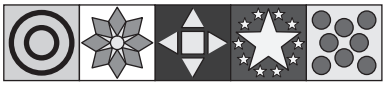
3 points

1. A floor is made of 5 different tiles. The tiles are laid in a repeating pattern. Eva takes a picture of the floor with her phone, as shown. What is the repeating pattern of the 5 tiles?



(**A**) 

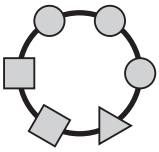
(**B**) 

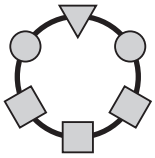
(**C**) 

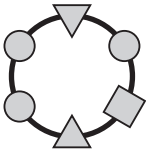
(**D**) 

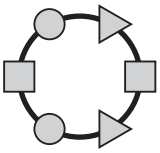
(**E**) 

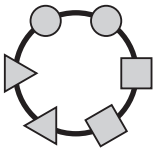
2. Luna's bracelet is made of three different types of bead. There are two beads that are spheres next to each other. There are not two beads that are cubes next to each other. Which of the following could be Luna's bracelet?

(**A**) 

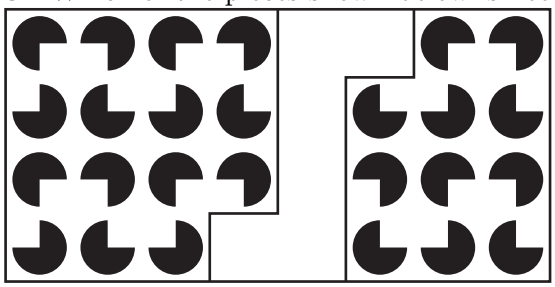
(**B**) 

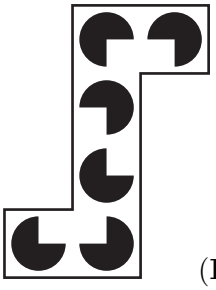
(**C**) 

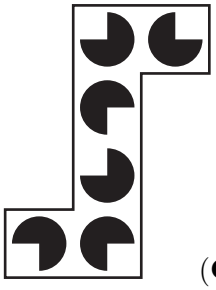
(**D**) 

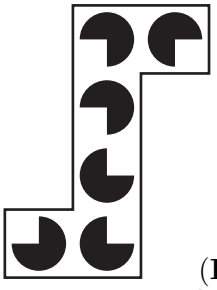
(**E**) 

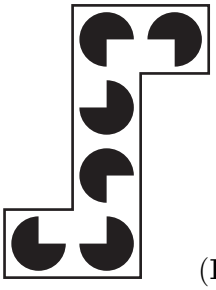
3. Which of the pieces shown below is needed to complete the puzzle?

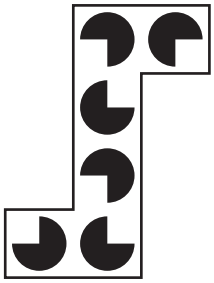


(**A**) 

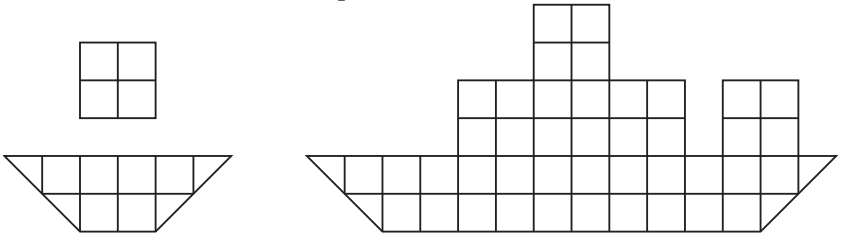
(**B**) 

(**C**) 

(**D**) 

(**E**) 

4. Sepehr has two types of small paper pieces, as shown. How many small pieces of paper in total does he need to create the ship shown?

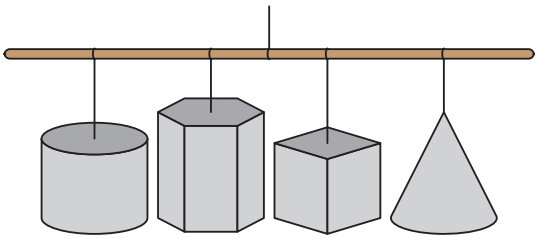


(**A**) 4 (**B**) 5 (**C**) 6 (**D**) 7 (**E**) 8

5. A standard dice has six faces numbered from 1 to 6. The sum of the numbers on opposite faces is always 7. The numbers on three faces that share a common vertex have a sum of 14. What are the numbers on the other three faces?

(**A**) 1, 2 and 4 (**B**) 3, 5 and 6 (**C**) 2, 5 and 6 (**D**) 1, 2 and 6 (**E**) 2, 3 and 4

6. There are four solids hanging in the classroom, as shown in the picture. Betty is looking at them from below. What can she see?



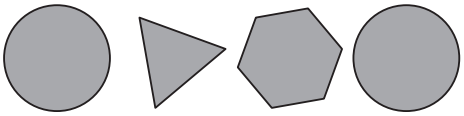
(**A**)

(**B**)

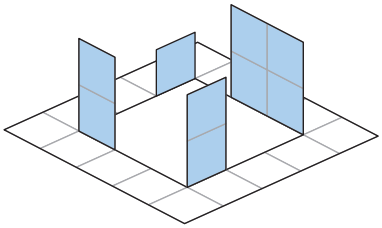
(**C**)

(**D**)

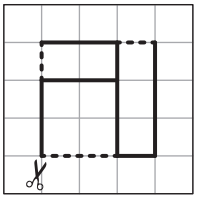
(**E**)



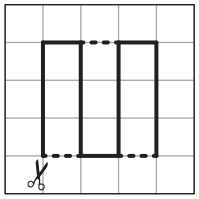
7. On a template, dashed lines show where to fold and solid lines show where to cut. Which of the templates below did Edvard use to create the figure on the right?



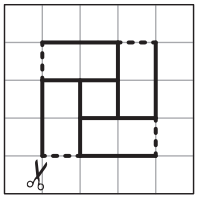
(**A**)



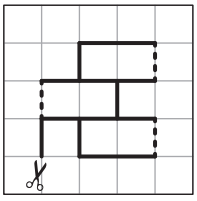
(**B**)



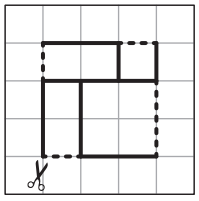
(**C**)

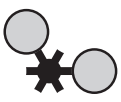
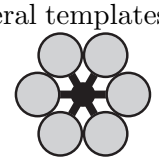


(**D**)



(**E**)



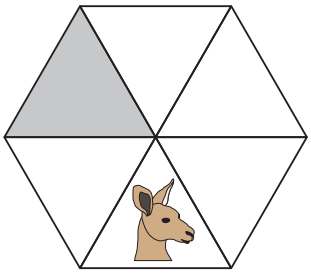
8. Anthea wants to lay several templates of the following shape  on top of each other to form a flower that looks like this: 
The templates can overlap. What is the smallest number of templates she needs?

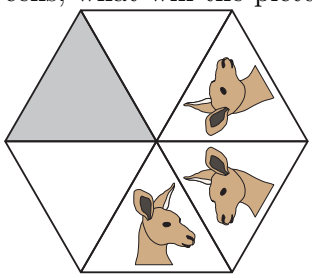
(**A**) 2 (**B**) 3 (**C**) 4 (**D**) 5 (**E**) 6

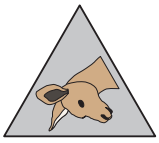
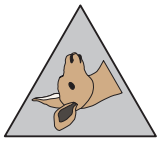
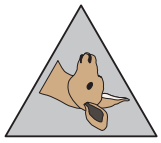
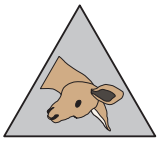
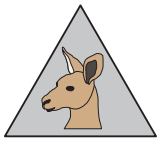
9. A pizza is cut into 8 equal slices. Max eats $\frac{1}{4}$ of the pizza and Grace eats $\frac{1}{2}$ of what is left. How many slices remain?

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

10. The first figure shows the face of a kangaroo. The second figure shows what has happened after the kangaroo has been reflected twice in the lines of the figure. When this process is continued to fill all the cells, what will the picture of the kangaroo in the shaded triangle look like?



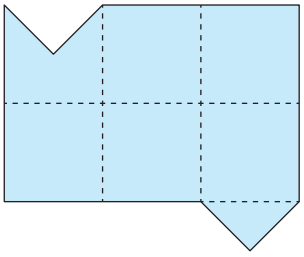


(**A**)  (**B**)  (**C**)  (**D**)  (**E**) 

4 points

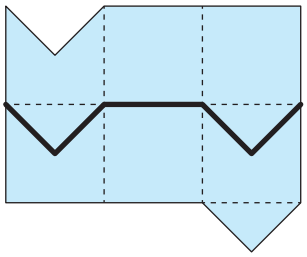
11. Cave tours are conducted in three-seater vehicles. The vehicles leave at two-minute intervals, and the ride takes 10 minutes. The first group of three from a large group of 30 people started their tour at 13:00. At what time did the final group of three from the large group finish their tour?

(**A**) 13:18 (**B**) 13:20 (**C**) 13:28 (**D**) 13:30 (**E**) 14:40

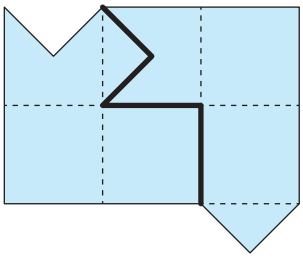


12. Which option shows a cut that divides the figure shown into two identical parts? The parts may be flipped.

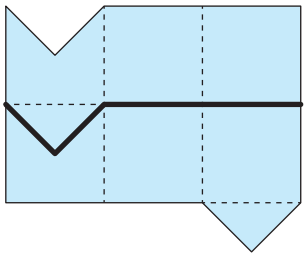
(**A**)



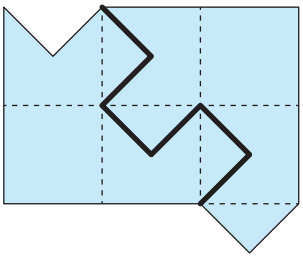
(**B**)



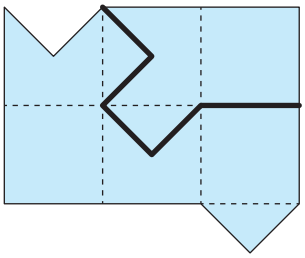
(**C**)



(**D**)



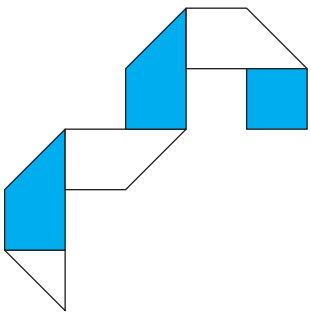
(**E**)



13. A 24-hour digital clock runs correctly but the positions of two of its digits are swapped. The clock currently shows 15:69. What will the clock show 1 minute later?

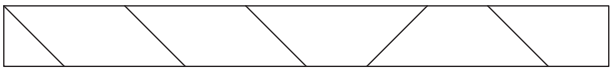
(**A**) 10:70 (**B**) 15:70 (**C**) 16:69 (**D**) 16:70 (**E**) 25:69

14. Lukas has a rectangular strip of paper. One side is white, the other side is dark. On the white side he drew 5 lines and folded the strip along them, as shown in the picture. What did the strip look like before folding?

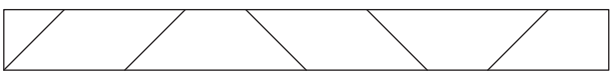


(**A**)

(**B**)

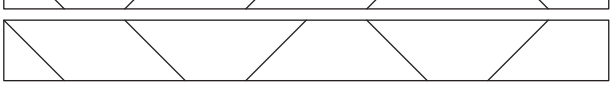


(**C**)

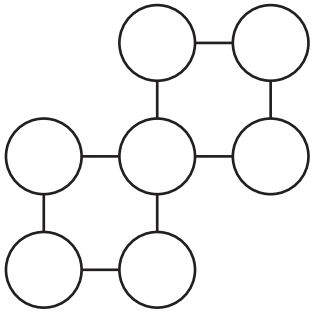


(**D**)

(**E**)



15. The numbers 0, 1, 2, 3, 4, 5 and 6 are written in the circles shown on the right. Each number is placed in a different circle, so that the sum of the numbers in each row is the same. What is the product of the numbers written in the middle row?



(**A**) 0
(**B**) 15
(**C**) 18
(**D**) 24
(**E**) 30

16. Ira wrote the numbers from 1 to 16 into the cells of a strip of paper, as shown.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

Then she folded the strip in half, as shown:

1	2	3	4	5	6	7	8

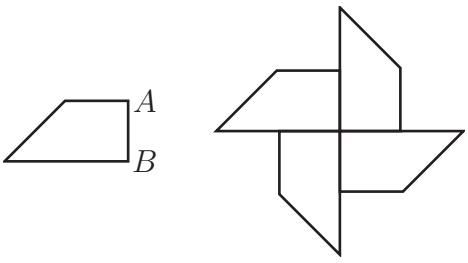
She continued folding it in half in the same way and ended up with only two cells:

1	2

Ira then poked a needle through the whole strip where the number 1 was written, unfolded the strip and added up all numbers in pierced cells. What answer did she get?

(**A**) 64 (**B**) 68 (**C**) 99 (**D**) 128 (**E**) 136

17. The trapezium on the left has a perimeter of 22 cm. Four of these trapezia are joined together, without overlapping, to form the pinwheel design shown on the right. The perimeter of the pinwheel is 56 cm. What is the length of the side AB in the trapezium?

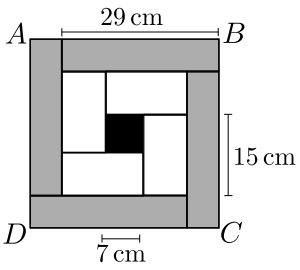


(**A**) 8 cm (**B**) 6 cm (**C**) 3 cm
(**D**) 4 cm (**E**) 5 cm

18. There are some toffees in a box. Charles, Paul and Simon take turns to take some toffees from the box. Charles takes 1, then Paul takes 2, then Simon takes 3, then Charles takes 4, then Paul takes 5 and so on. When the box does not contain enough toffees to follow this rule, the person whose turn it is takes all the remaining toffees. Paul took 25 toffees in total. How many toffees were there in the box initially?

(**A**) 48 (**B**) 50 (**C**) 55 (**D**) 56 (**E**) 65

19. The square $ABCD$ is divided into 4 identical grey rectangles, 4 identical white rectangles and one black square, as shown. The side-length of the black square is 7 cm. The side-length of the longer sides of the white rectangles is 15 cm and the side-length of the longer sides of the grey rectangles is 29 cm. What is the side-length of the square $ABCD$?



(**A**) 33 cm (**B**) 34 cm (**C**) 35 cm
(**D**) 36 cm (**E**) 37 cm

20. A group of students has a box of apples. They want to divide the apples equally among themselves. They note that:
If there were 80 more apples, every student would get 4 more apples each.
If there were 8 fewer students, every student would get 6 more apples each.
How many apples are in the box?

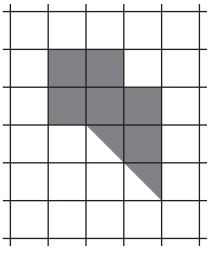
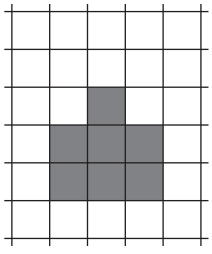
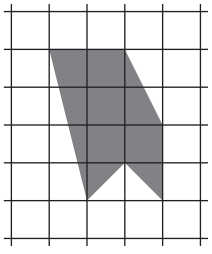
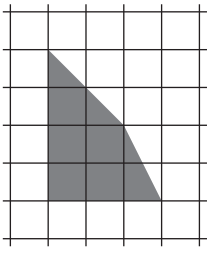
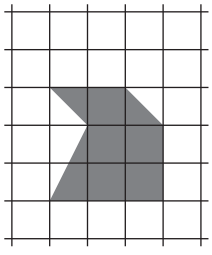
(**A**) 240 (**B**) 180 (**C**) 160 (**D**) 120
(**E**) It can not be determined.

5 points

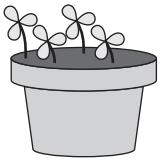
21. A detective is trying to determine the route the suspect took. The suspect gives three different statements:
"I went from New York via Chicago to Omaha."
"I went from New York via Miami to Kansas City."
"I went from San Francisco via Miami to Omaha."
In each statement, exactly one of the places and its position in that statement is correct. What is the route the suspect took?

(**A**) New York → Chicago → Omaha
(**B**) San Francisco → Chicago → Kansas City
(**C**) New York → Miami → Kansas City
(**D**) San Francisco → Miami → Omaha
(**E**) Chicago → San Francisco → Kansas City

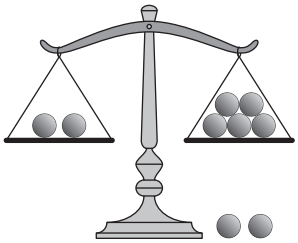
22. The areas of four of the shaded regions shown are the same. Which shaded region has a different area?

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

23. Five siblings have each planted flowers in a pot on their balcony. Now the first flowers are starting to sprout. The 5 pots are shown below. In Jim's and Frederic's pots there are 3 times as many flowers in total as there are in Zoe's pot. In Frederic's and Carl's pots there are twice as many flowers in total as there are in Rene's pot. Which is Frederic's pot?

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

24. Julia has 9 balls with masses 1kg, 2kg and so on up to 9kg. She puts seven of the balls on a scale so that the scales balance, as shown. Two of the balls are placed on the left plate and five of the balls are placed on the right plate. What is the smallest possible total of the masses of the two balls that are not used?



(**A**) 5 kg (**B**) 7 kg (**C**) 9 kg (**D**) 11 kg (**E**) 17 kg

25. Flo has a combination lock with 4 digits ranging from 0 to 9. He has forgotten the combination, but he does remember that the digits are all odd and they either increase or decrease from left to right. What is the largest number of combinations he would need to try to be sure he can open his lock?

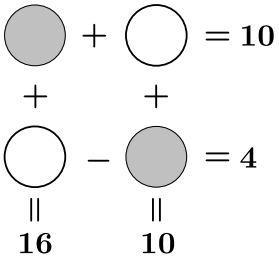
(**A**) 6 (**B**) 8 (**C**) 10 (**D**) 12 (**E**) 14

26. Renate removed several numbers from the table below so that the sum of the remaining numbers in each row and each column is 15. What is the sum of the numbers she removed?

4	7	7	4
6	4	4	5
5	5	4	6
5	8	7	4

(**A**) 31
(**B**) 29
(**C**) 27
(**D**) 25
(**E**) 24

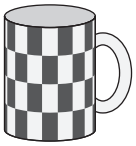
27. Each circle contains a number so that the calculations are correct. What is the sum of the numbers in grey circles?



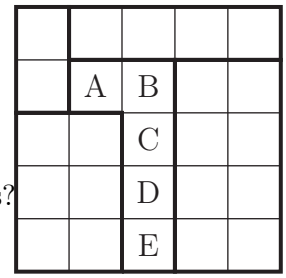
(**A**) 10 (**B**) 12
(**C**) 14 (**D**) 16
(**E**) 23

28. The five cups shown belong to Leonard, Rajesh, Amy, Penny and Sheldon, in some order. All the cups' handles are either black or white. Leonard's cup and Rajesh's cup are the same size but their handles are different colours. Amy's cup and Penny's cup are different sizes but their handles are the same colour.
Which cup belongs to Sheldon?

(**A**)  (**B**)  (**C**) 

(**D**)  (**E**) 

29. A square playground is divided into 25 small squares which form five regions. The regions are marked in the picture with a bold line. Karla the Kangaroo places five swings in the playground. Each row, each column and each region contains exactly one swing. No two swings can occupy adjacent squares. Adjacent means that they share a side or a corner.
In which of the squares marked with a letter can Karla place one of the swings?



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

30. Ali wrote out all the numbers from 1 to 7000 in order, without separating them with spaces, commas or any other symbols. How many times does the digit sequence '2026' appear in the resulting list of numbers?

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