

Tasks T1 – T8 carry 3 points each

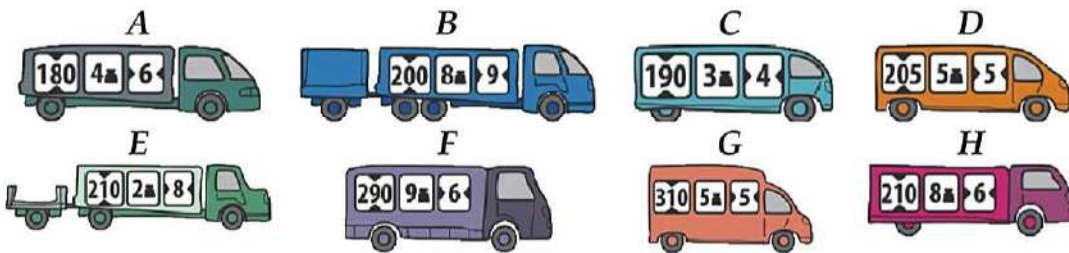
T1. Two roads to Treeville

Beavertown and Treeville are connected by 2 roads. Road one has a bridge, road two has a tunnel and even a ferry. Only vehicles weighing less than 7 tonnes can cross the bridge. Only vehicles with a height less than 300 centimetres can go through the tunnel. Only vehicles shorter than 7 meters can take the ferry.

Every vehicle has a notice on the side that lists height, weight and length. For example, the following vehicle is 180 centimetres tall, weighs 4 tonnes, and is 6 meters long:



Question / Challenge



Which of the above cars can go through both roads?

- A) A, C, D
- B) C, D, G
- C) A, E, H
- D) E, G, H

T2. Ninja

One beaver wants to become a ninja so hard that he came up with his own ninja name.



Translation table from letters to ninja-codes:

A – ka	J – zu	S – ari
B – pi	K – me	T – chi
C – mi	L – ta	U – do
D – te	M – rin	V – ru
E – ku	N – to	W – mei
F – lu	O – mo	X – na
G – ji	P – mor	Y – fu
H – ri	Q – ke	Z – zi
I – ki	R – shi	

**Question / Challenge**

What is the beaver actually called if his ninja name is "zukame moru"?

- A) JOSIP
- B) JANI
- C) JAKOV
- D) JURICA

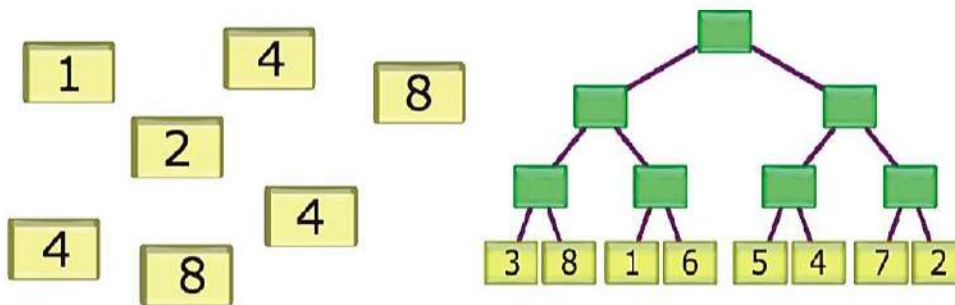
**T3. Beaver Tournament**

Beaver Krešo watched a tournament of parallel 100 meters races and recorded the winners of each race for all stages of the tournament on a board. He used numbered cards to represent each participant at each stage of the competition. The participants are numbered from 1 to 8.

Then, his younger brother Tomo mixed up all the cards, except those from the first stage of the competition.

**Question / Challenge**

Krešo did not get upset, because he realised that he could reconstruct all the tournament results from the mixed cards (left, in figure below) and the information from the first stage of the tournament (right, in the figure below).

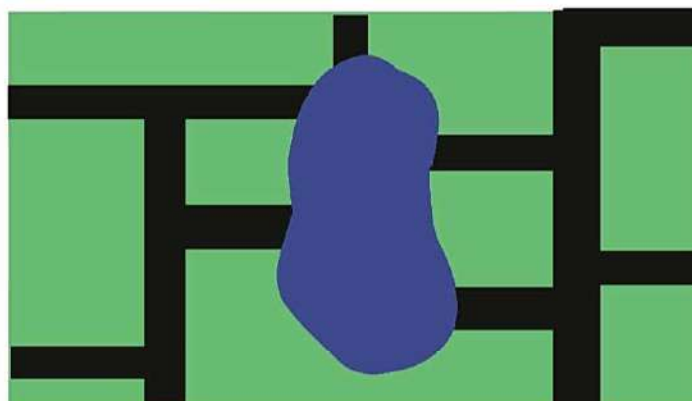


Can you tell which is the winning number ?

- A) 1
- B) 2
- C) 4
- D) 8

**T4. Colored paths**

John chooses a paint program on his computer to draw a picture of a park with a blue pond and black paths around it.



He wants to change the path color to brown. He chooses the **fill** tool and the brown color to paint all of the black paths brown.

Note that the fill tool only paints paths which are connected.

**Question / Challenge**

What is the **smallest number** of clicks he needs to paint all paths brown?

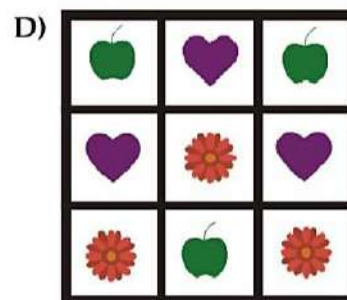
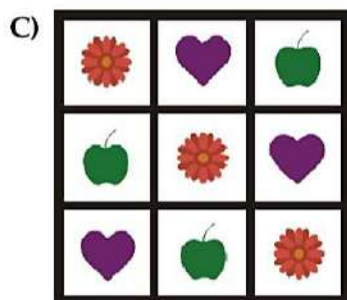
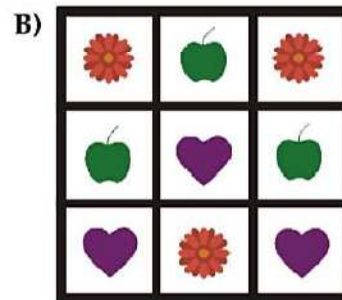
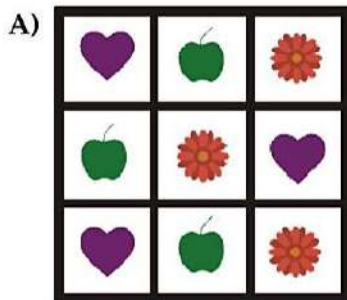
- A) 3                      B) 4                      C) 2                      D) 5

**T5. Sudoku**

Benjamin has to fill a box that has 9 sections with different shapes in such way that there can be only 1 of the same shape in every row and every column.

**Question / Challenge**

Unfortunately, he succeeds only once. Which of the following boxes is the correct one?



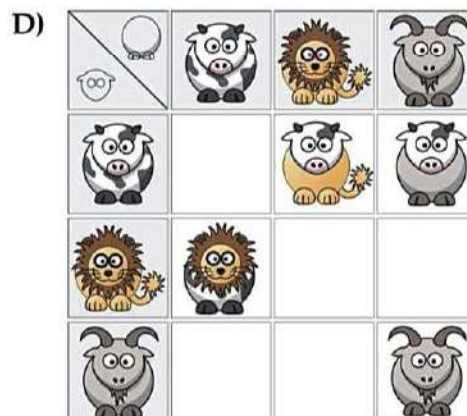
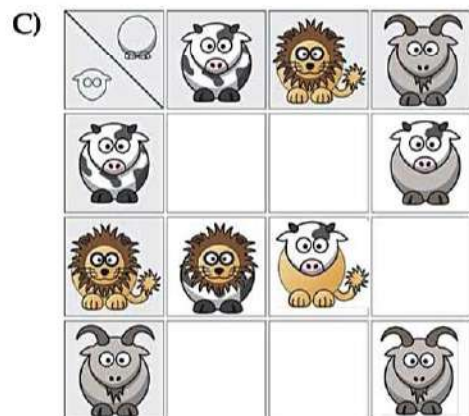
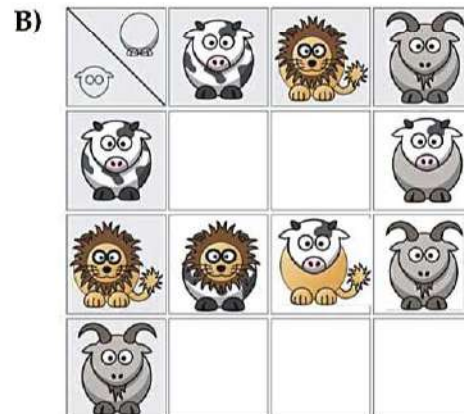
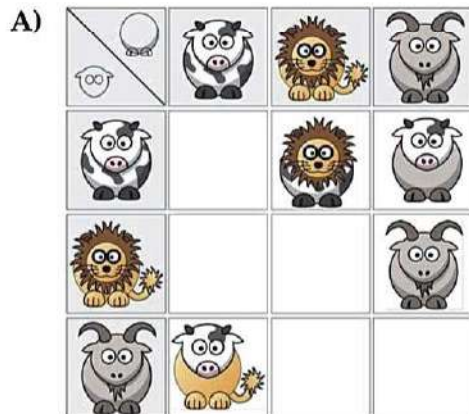
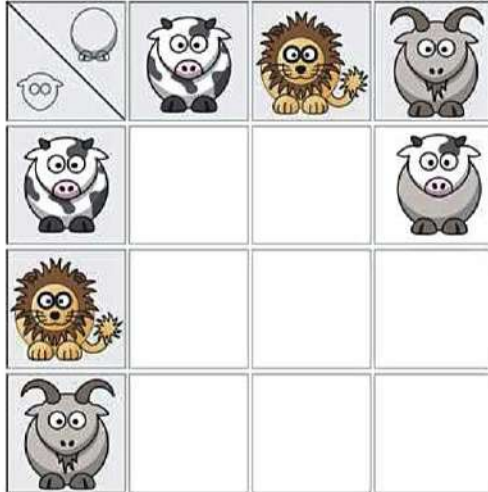
**T6. Crossbreeds**

Wizards discovered a special method that makes it possible to crossbreed any animal. In that special case the newborns inherit a head from their father and body from their mother. The wizards have already started to prepare a table to predict the outcome for several combinations.



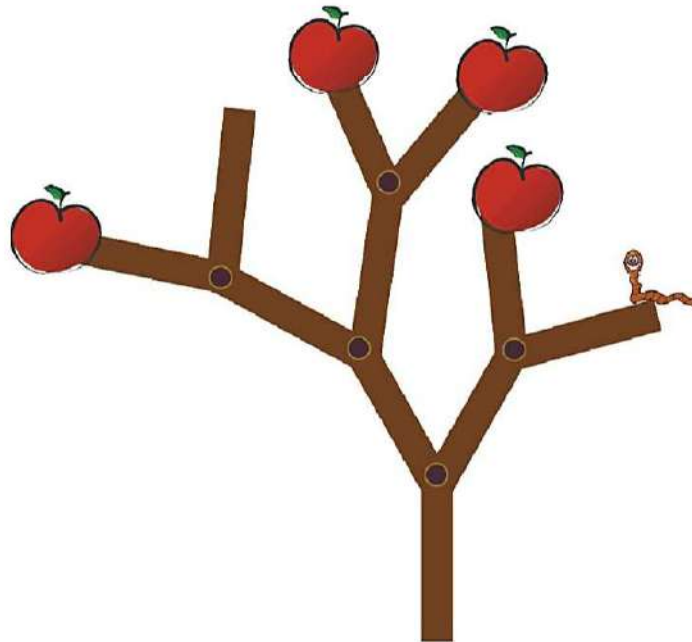
Question / Challenge

Where should the three animals be placed?



**T7. Worm**

A worm is sitting at the end of the branch of the big tree. It wants to eat all the apples by moving through the tree branches (each section of the branch is one meter long).



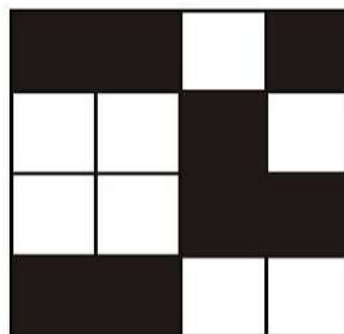
**Question / Challenge**

How many branch sections at least the worm has to crawl if it wants to eat all the apples?

- A) 4                      B) 9                      C) 13                      D) 15

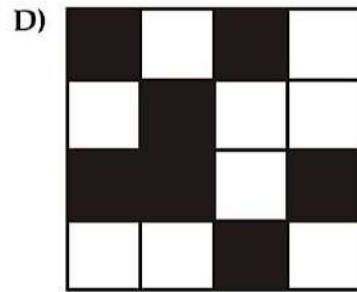
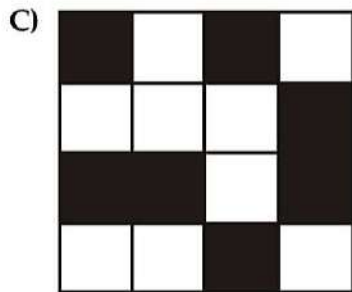
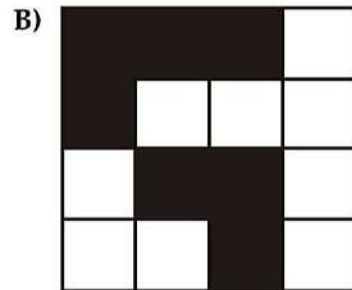
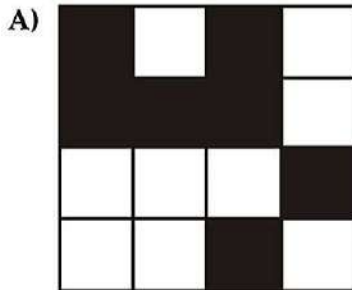
**T8. Bebras market**

At the beaver market on each product there is a Bebras code to recognize the item. For example: the Bebras code for the item with the serial number "1101001000111100" is shown as below.



**Question / Challenge**











Which of the following choices is the Bebras code of the serial number "1010000111010010"?



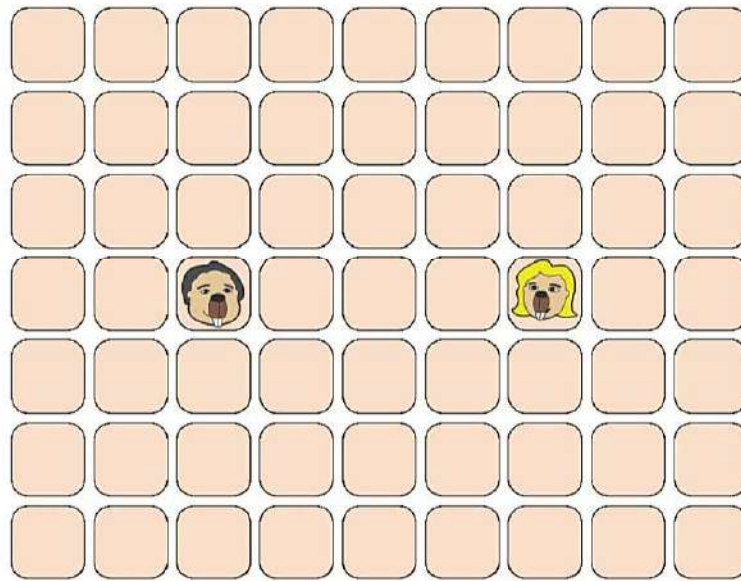
Tasks T9 – T16 carry 4 points each

**T9. Dance Off**

Two beavers are having a dance-off. Each will respond to the crowd's different type of cheering and perform a specific dance move. They perform their moves simultaneously one square at a time in the direction corresponding to the arrows below. The following table depicts how the two competitors will move:

	Wow!	Roar!	Clap!	Boo!
 Justin				
 Selena				

So for example, if the crowd cheers "Roar!", Justin will move one square right then one square down and simultaneously, Selena will move one square up and one square to the left. They start on the dance floor as follows:



**Question / Challenge**

Which of the following sequences of cheers will cause the two to finish on the same square?

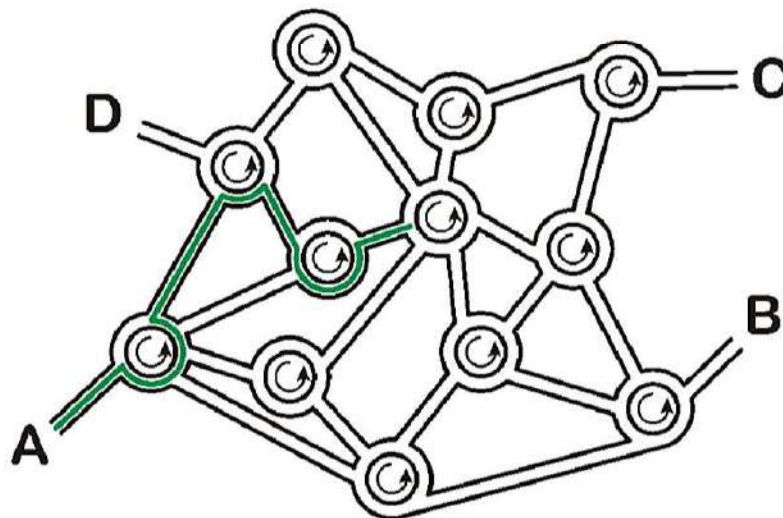
- A) Boo! Roar!
- B) Wow! Roar!
- C) Roar! Roar!
- D) Clap! Roar!

**T10. Roundabout City**

In Roundabout City, navigation software does not give instructions like

- In the next roundabout, take the 4th exit.
- In the next roundabout, take the 1st exit.
- In the next roundabout, take the 2nd exit.

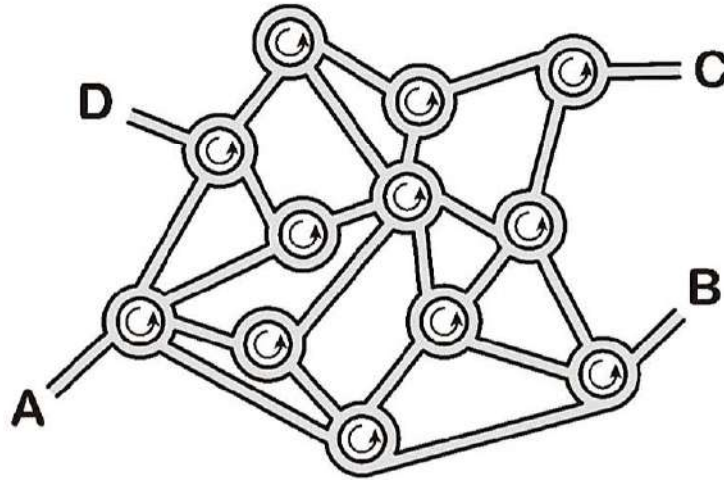
Instead, it gives you a sequence of numbers, like "4 1 2" which would make you go this way:





**Question / Challenge**

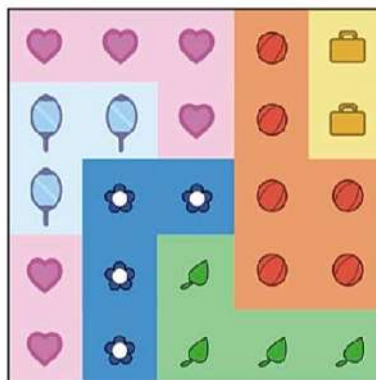
If we start from A and follow the sequence 3 1 3 2 3, where will we end up?



- A) A                      B) B                      C) C                      D) D

**T11. Painting wallpaper**

Beaver Robyn is papering the wall using rectangle wallpapers of different sizes. The wall is sized 5 by 5. The wallpaper is always placed so as not to go beyond the borders of the wall.



She uses a different colour (shown with different symbols) for each rectangle of wallpaper. Sometimes, she covers part of the wallpaper with a new rectangle of a different colour.

**Question / Challenge**

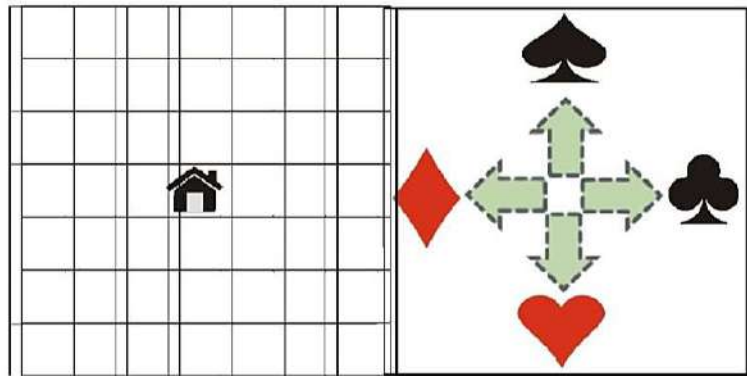
In which order did Robyn place the wallpaper?

- A)                      B)
- C)                      D)



**T12. Swimming Schema**

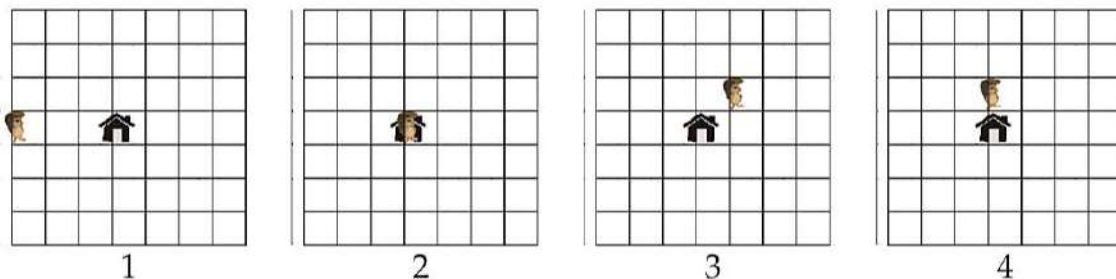
Maria lives in the center of the map. She plans to swim through his world and choose at every square a random direction. The random directions she generates by drawing a card of a shuffled deck consisting of Diamonds (♦), Hearts (♥), Clubs (♣) and Spades(♠).



Maria draws cards and moves corresponding to the schema in the figure right above. The first card she draws is a Diamond (♦), therefore she moves to the left square.

**Question / Challenge**

Which of the four positions 1 - 4 could Maria reach after 2 additional draws?



- A) 1, 2
- B) 1, 4
- C) 3, 4
- D) 2, 3

**T13. Shortening the Messages**

You are searching for objects in a field and each object is labeled with a capital letter of the alphabet (A, B, C, ..., Z). Now you want to send a short message to a friend describing all these objects.

You figured out a way to make messages shorter by grouping similar objects: to count the number of occurrences of each object and to place the number in front of the object label.

For example, instead of sending the message AAAAAABBBBCCCCC you can send the compressed message 6A3B5C.

**Question / Challenge**

If each one letter or one digit equals to one character, how many characters will be needed after the compression of the following message:

DDDDDDDEEEEEEA AAAAABBBBBBBBBBBBBBBBBBCCCCCCCCGGGGGGGGGGHH  
HH

- A) 15
- B) 16
- C) 17
- D) 18

**T14. Musical Chair**

7 beavers are playing a game of musical chairs, but they do not know the rules.



When the music starts, the beavers move in any direction they want. And more than one beaver can occupy a chair at the same time.

In each round, large beavers (A and B) move 3 chairs counterclockwise because they are smarter. Medium beavers (C and D) move two chairs counterclockwise, whereas the smallest beavers (E, G and F) can only move only one chair clockwise.

**Question / Challenge**

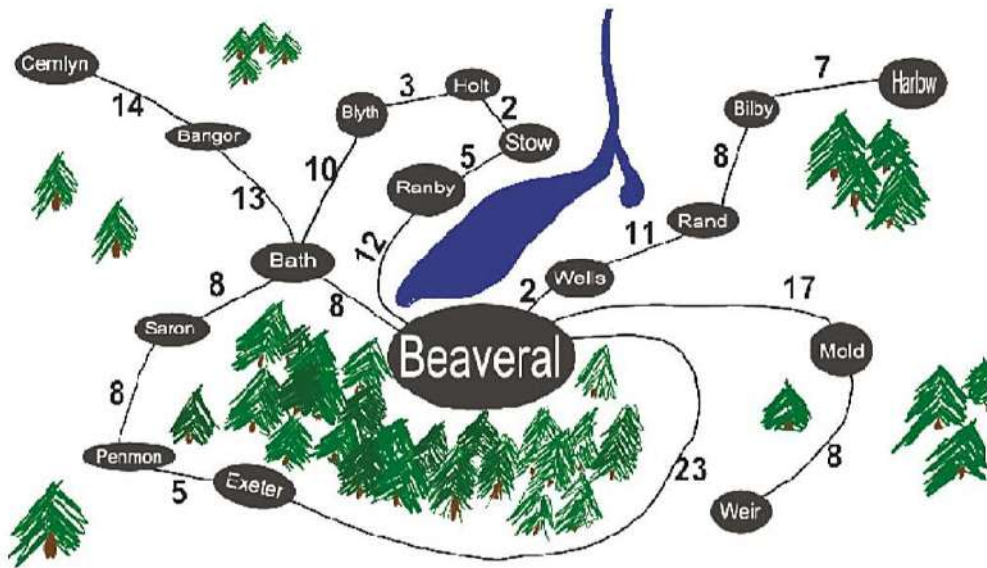
Which chairs are unoccupied after 3 rounds?

- A) 2 and 7
- B) 3 and 7
- C) 1 and 2
- D) 1 and 3

**T15. Birthday Celebration**

Patrick lives in Beveral and he invited friends from all the surrounding villages to celebrate his birthday. However, only friends who live not more than 20 km away came to celebrate.

On the map here after are entered distances between villages.



**Question / Challenge**

From which of these villages did not come friends to celebrate with Patrick?

- A) Blyth
- B) Holt
- C) Saron
- D) Bilby





**T16. Sarah's shoes**

Sarah will go with her father to buy new footwear. Her father will spend no more than 100 Euros. Sarah prefers:

- black color; and
- boots.

**Question / Challenge**

Which footwear can she choose?

- A)  84 Euro
- B)  151 Euro
- C)  84 Euro
- D)  114 Euro

Tasks T17 – T24 carry 5 points each

**T17. LeftRight**

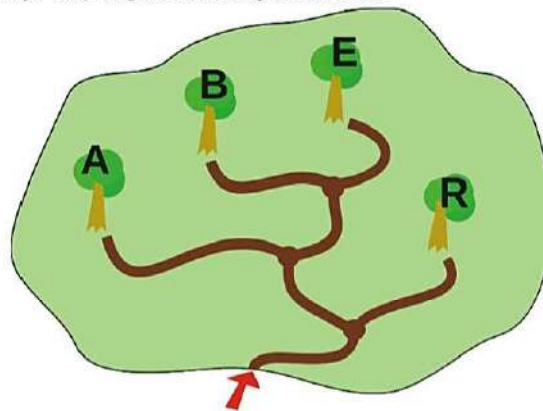
The beavers have made a code that uses this map:

- Every tree in the park is named with a letter.
- The code for each letter is found by how to get to its tree by turning left and right.
- The code for each letter always starts from the park entrance.

**Examples**

*Example 1:* The code for **A** is LL because to get to tree A from the park entrance you must turn left twice.

*Example 2:* The code for the word **BAR** is LRLLLR.



**Question / Challenge**

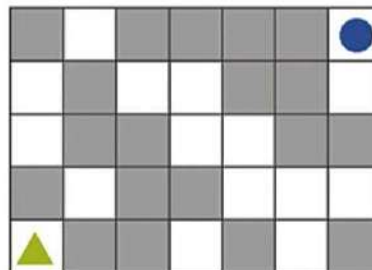
How many letters are there in the beaver's code for the word BEAR?

- |       |      |
|-------|------|
| A) 6  | B) 7 |
| C) 11 | D) 9 |

**T18. Erase walls**

The maze consists of empty fields (white squares) and walls (gray squares).

We can move from one empty field to the adjacent empty field in the horizontal or vertical direction (not diagonally).



**Question / Challenge**

What is the minimum number of walls that need to be demolished in order to enable moving from the bottom left corner to the top right corner of the maze?

- |      |      |
|------|------|
| A) 2 | B) 7 |
| C) 5 | D) 3 |



**T19. News editing**

There are 10 students working on the school’s newspaper. Every Friday they write or edit their own articles. On the table below, the colored cells show when the students need a computer to work. The computers are all the same. During any one hour, only one student at a time can work on a computer.

Student	Hours							
	8:00	9:00	10:00	11:00	12:00	13:00	14:00	
1		Red	Red					
2			Red	Red	Red	Red		
3	Red	Red						
4					Red	Red	Red	
5		Red	Red					
6				Red	Red			
7			Red	Red	Red	Red		
8		Red						
9	Red	Red	Red					
10						Red	Red	

**Question / Challenge**

What is the minimum number of computers needed for all students to work according to the schedule above?

- A) 4
- B) 5
- C) 6
- D) 10

**T20. One Armed Beaver**

Poor David broke his arm and can only use one arm right now. He still wants to sort his wood collection based on their taste. The wood collection consists of ten different pieces of wood. The wood is valuable, so David is not allowed to let the wood lay on the ground while sorting them. So he looks for separate storages where he can only put one piece of wood on each. Since it’s difficult to have adequate separate storages, he wants as few as possible.



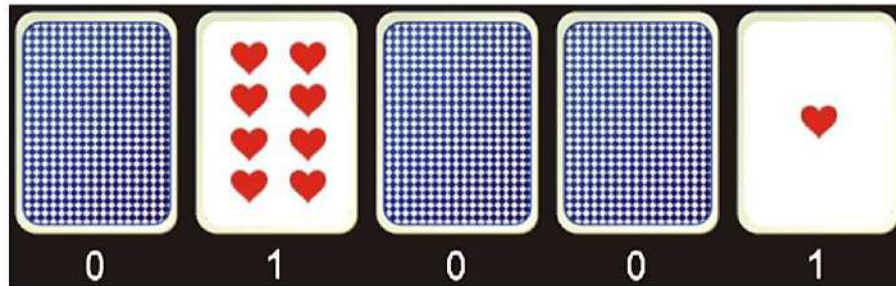
**Question / Challenge**

At least how many separate storages does he need to sort ten pieces of wood?

- A) 1
- B) 2
- C) 3
- D) 10

**T21. Card code**

Five cards are placed next to each other. From left to right the number of hearts on their faces are 16, 8, 4, 2 and 1, respectively. Each card has either number 1 or number 0 below it. If the number is 1, the card is face-up and its hearts are visible. If the number is 0, the card is face-down and its hearts are hidden. The cards can be used to generate codes for numbers. For example, there are 9 visible hearts in the figure below, so the code for the number 9 is 01001:



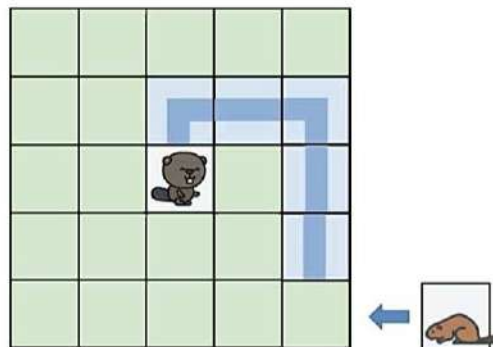
**Question / Challenge**

What is the code for 26 hearts?

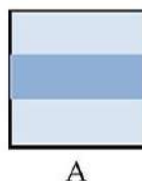
- A) 11010
- B) 10101
- C) 11110
- D) 11000

**T22. Beaver meeting**

We need to help Mommy Beaver to reach little Beaver by building a path with cards. Here is an example of a possible path:



There are only two types of cards:



The path in the example can be build with the following sequence of cards: BAABAB.

As we see, cards can be used rotated but the order cannot be changed.

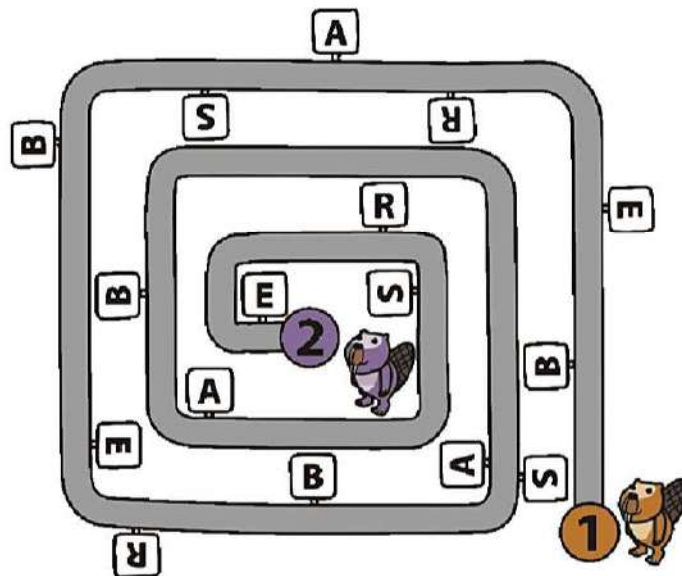
**Question / Challenge**

Which sequence of cards is not suitable to build a path from Mommy Beaver to little Beaver?

- A) BBAABB
- B) ABBABB
- C) BBAAAA
- D) AAABAB

**T23. Collecting Letters**

Zac and Pan want to travel on the path below. Zac wants to travel from Point 1 to Point 2 and Pan wants to travel from point 2 to point 1. Along the path there are letters ('B', 'E', 'R', 'A' and 'S') which Zac and Pan must collect. Zac and Pan can read only the letters located on their left. When Zac and Pan reach the end of the path they will have collected a sequence of letters.



**Question/Challenge**

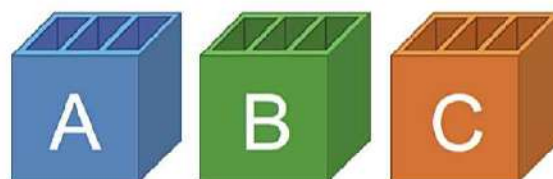
What are the sequences of letters the two beavers will create at the end of the road?

- A) Zac: BRSBAASE , Pan: RBSRBAE
- B) Zac: BRSEBAASE, Pan: RBBSRBAE
- C) Zac: BRSEBAASE, Pan: RBSRBAE
- D) Zac: BRSEBAAS, Pan: RBSRBE

**T24. Toy Storage**

Tom's toys have taken over every corner of his room.

Mom got really upset with this yesterday. She gave Tom three storage boxes:





Tom decides to store his toys according to these rules:

- (1) He will put cars into box A.
- (2) He will put animals with stripes into box B.
- (3) He will put animals with spots into box C.

Tom can put at most three toys into each box.

If a box is full, he will put the toy into the next box instead:

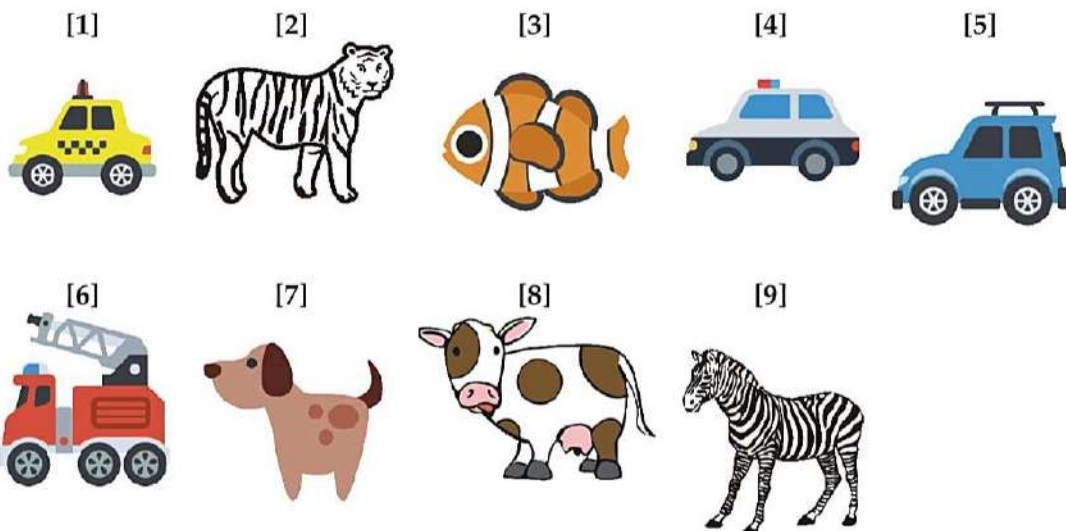
If box A is full he will put the toy into box B.

If box B is full he will put the toy into box C.

If box C is full, he will put the toy into box A.

### Question/Challenge

Tom has these nine toys, and he puts them into the boxes in this order:



In the end, every toy is in a box.

In which box is the zebra?

- A) A                      B) B                      C) C                      D) We cannot tell

