



Computer Talent Search

A project of the Institute of IT Professionals South Africa

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TALENT SEARCH 2015

JUNIOR: Grades 6 and 7

Not to be used before 16 March

If you are NOT in grade 6 or 7, please report that you have the wrong paper.
Only when the teacher says "START", may you begin.

1. Write your personal details and your answers on the answer sheet provided.
2. You will have 45 minutes to complete the 15 tasks.
3. You may answer the questions in any order, but it is important to place the answer in the correct line on the answer sheet.

The mark allocation is as is used in Europe for these competitions.

You get 45 marks to start off with.

A section: +6 marks for every correct answer -2 for every wrong answer.

B section: +9 marks for every correct answer -3 for every wrong answer.

C section: +12 marks for every correct answer -4 for every wrong answer.

If you do not answer a question, you get 0 (zero) for that task.

The maximum mark is 180.

Wait for the teacher to say "START".

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A1: Select a Picture

JA1 / IA1

Johnny has 8 photos. He wants to give one to Bella.

He asks Bella three questions to help him select the best picture.

Johnny's Question

Do you want a photo with a beach umbrella?

Do you want a photo where I wear something on my head? No

Do you want a photo where you can see the sea?

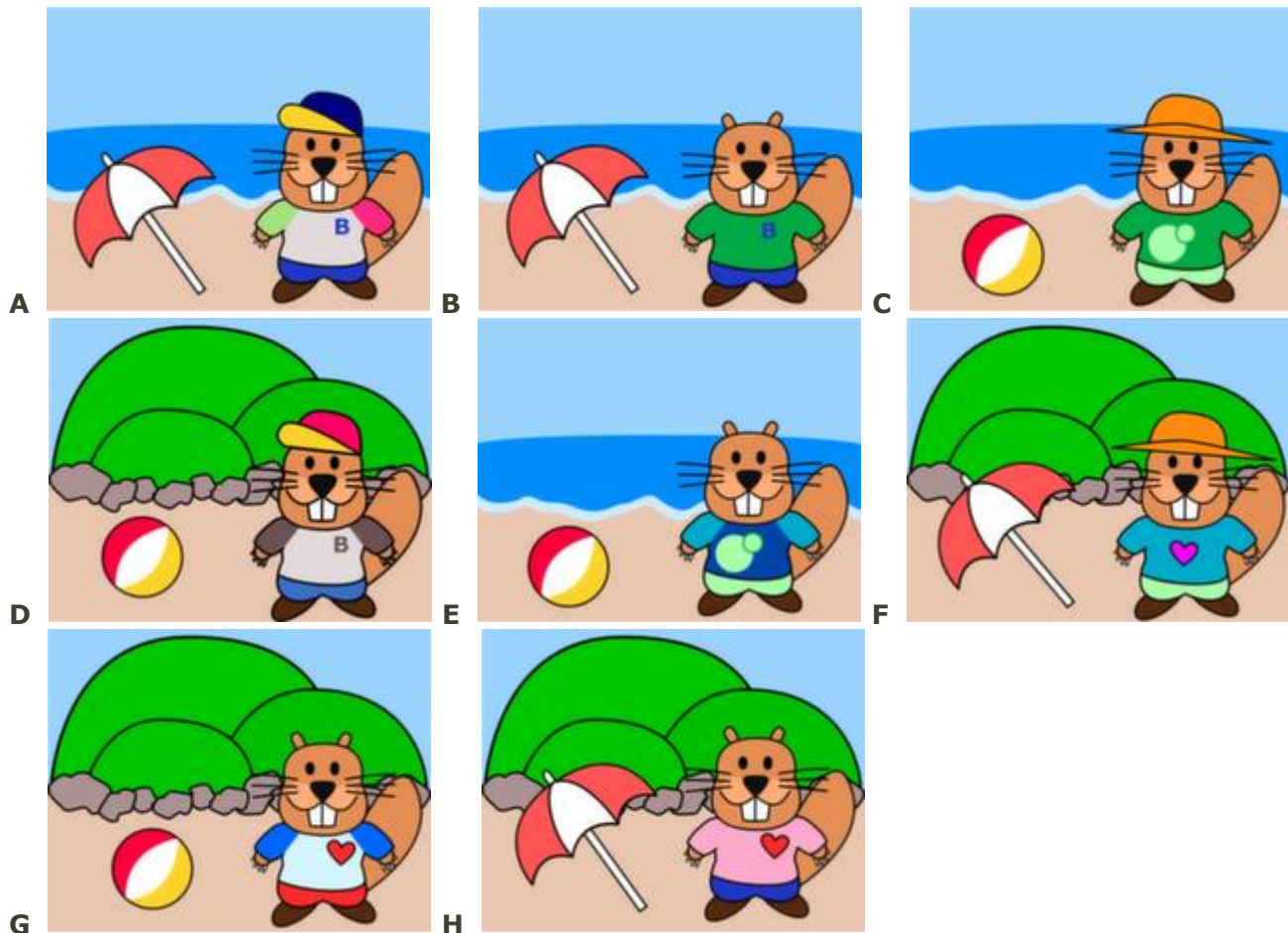
Bella's Answer

Yes

No

Yes

Which photo should Johnny give to Bella? Write down the letter of the picture in the appropriate block on your answer sheet.



A2: Tic Tac Toe

JA2

You are playing a game of Tic-Tac-Toe (Noughts-and-Crosses) with your friend. First your friend has to place a 'O', then you place your 'X'. You continue taking turns in this way. The player who places three marks in a horizontal, vertical or diagonal line wins.

It is your turn to put an 'X' in the grid below:

X	1	2
O	O	X
O	3	4

Where would you put your X so that you have the best chance of winning? Place the number of the block of your choice in the appropriate block on your answer sheet.

A3: Ice Cream

At the LIFO ice cream parlour the scoops of ice cream are stacked on your ice cream cone in the exact order in which you ask for them.

What do you have to say in order to get the ice cream shown in the picture?

“I would like to get an ice cream with ... ”

Put the letter (A, B, C, or D) of the correct answer in the appropriate block of your answer sheet.

- A. **Chocolate, Smurf and Strawberry**
- B. **Strawberry, Smurf and Chocolate**
- C. **Chocolate, Strawberry and Smurf**
- D. **Strawberry, Chocolate and Smurf**

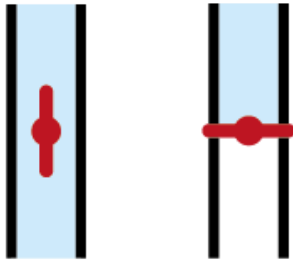
JA3



A4: Watering

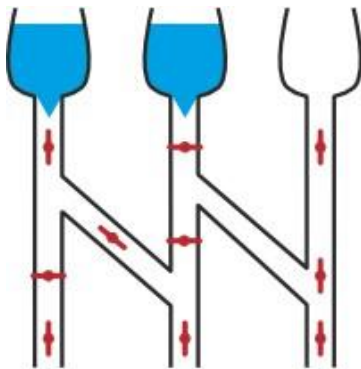
JA4

The diagram shows how a watering system is connected. The system consists of tubes and valves. Open and closed valves are shown in the diagram by the direction of the switch:



Open valve Closed valve

Water only flows through open valves.



1 2 3

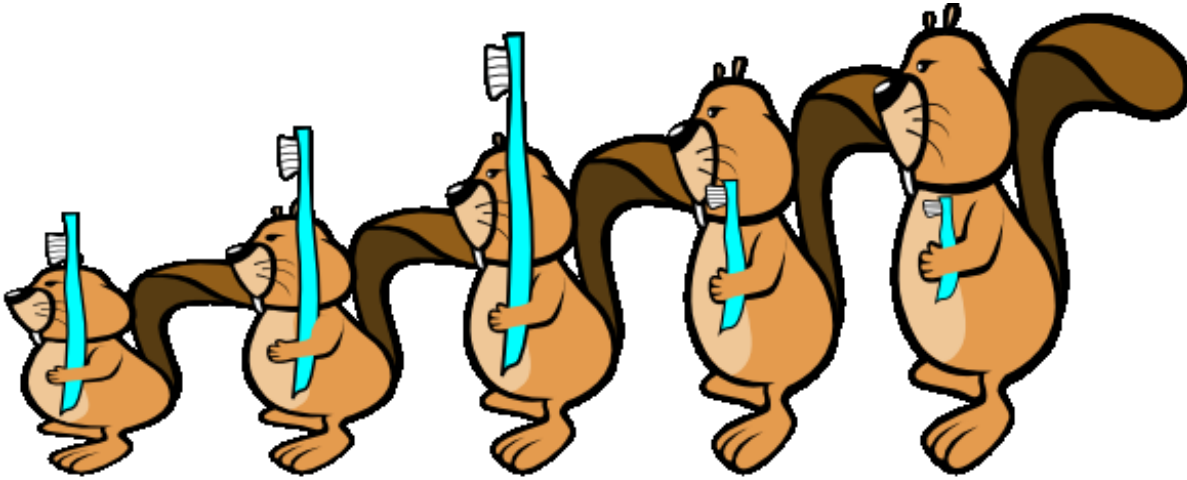
Which of the flowers (if any) will receive water when the valves are in the positions shown in the diagram. Write down the letter of the correct answer in the appropriate block on your answer sheet.

- A: None of the flowers will get water.
- B: Flower 1 and 2 will get water.
- C: Flower 2 and 3 will get water.
- D: Only flower 2 will get water.

A5: Toothbrushes

JA5

It is time for bed! Every beaver should have a toothbrush that matches their size. But look at the picture to see what has happened.



Ann Ben Chad Dan Eve

“Not so fast!” sighs mother beaver. “Eve and Chad, swap your brushes! Ann and Chad, you too!” But then she does not know how to continue.

Which two beavers still need to swap their toothbrushes so that all the beavers have the correct brushes?

- A: Ben and Chad**
- B: Ann and Eve**
- C: Ben and Dan**
- D: Nobody**

Write down the letter of the correct answer in the appropriate block on your answer sheet.

B1: Only Nine Keys

IA2

Daniel is sending text messages from his old phone.

For every letter he has to press the proper key once, twice, three or four times, followed by a short pause.



In order to type 'C' he has to press the number 2 key three times because 'C' is the third letter written on this key.

In order to type 'HIM' he has to press the number 4 key twice, followed by the number 4 key 3 times and finally the number 6 key once.

Daniel presses exactly six times to enter the name of his friend.

What is the name of his friend? Is it:

Miriam,

Iris,

Emma,

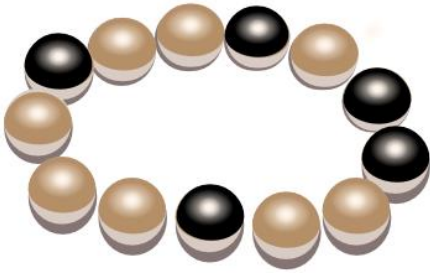
Ina?

Write down the name of the friend in the appropriate block on your answer sheet.

B2: Magic Bracelet

JB2

A princess has a magical bracelet that looks like this:



When she stores her bracelets in her drawer she first opens them.

Which of the four bracelets in her drawer is the magical one?

A:



B:



C:



D:



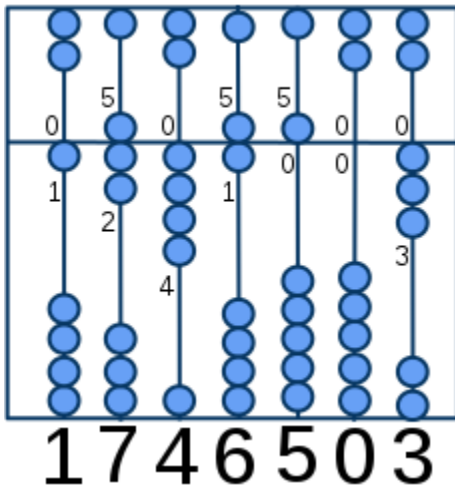
Write the letter of the correct answer in the appropriate space on your answer sheet.

B3: Abacus

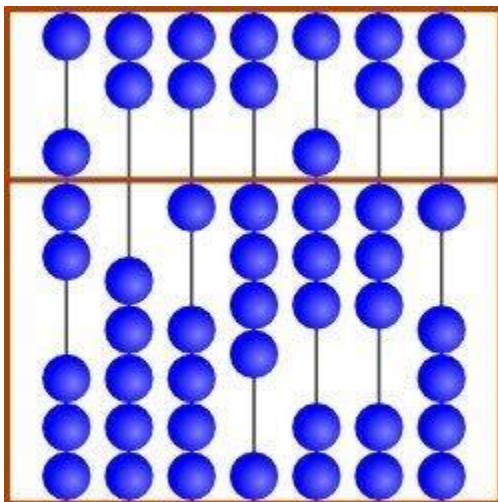
A number is represented on a Chinese abacus by the position of its beads.

The value of a bead on the top part is 5; the value of a bead on the bottom part is 1. The abacus is reset to zero by pushing the beads away from the centre.

To represent the number 1 746 503 the appropriate beads are moved towards the centre of the abacus:



What number does the following abacus represent? Enter the digits in the appropriate block on your answer sheet:



B4: Loading Lisas

JB4 / IB1 / SA4

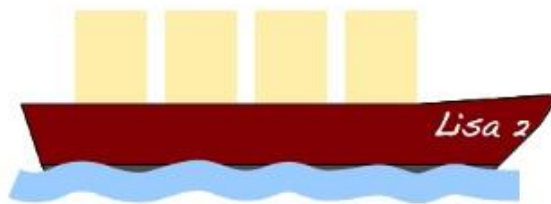
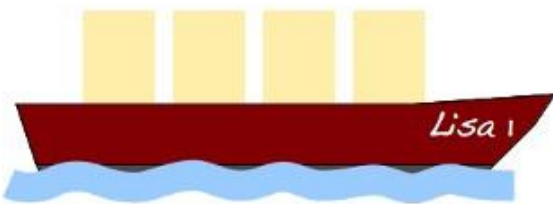
Two fishermen own two boats, named "Lisa 1" and "Lisa 2". Each boat can hold a maximum cargo of 300kg.

The fishermen are given barrels filled with fish to transport. On each barrel is a number that shows how heavy the barrel is in kilograms.

You must transport as much fish as possible, but make sure that neither boat carries more than 300kg.

Write down the number of the boat and the cargo it will carry in the appropriate space on your answer sheet.

Eg: 1 : 130 + 120, 2 : 90 + 90 + 60

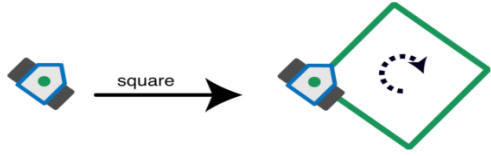
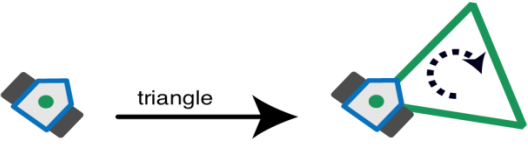
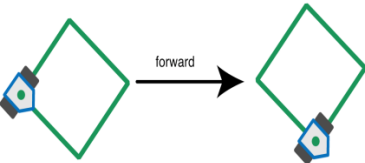
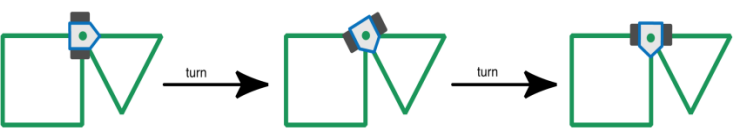


B5: Drawbot

The robot 'Drawbot' can drive and draw at the same time!

You can give Drawbot the following instructions: **square**, **triangle**, **forward**, **turn**.

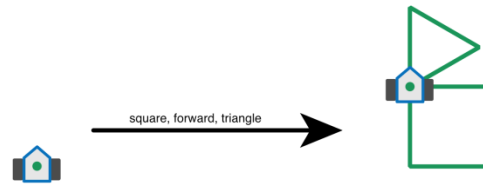
The instructions work as follows:

square: Drawbot draws a square. At every corner he turns right.	
triangle: Drawbot draws a triangle. At every corner he turns right.	
forward: Drawbot drives forward on a line that has been drawn until the next corner.	
turn: Drawbot turns to the right until the next drawn line.	

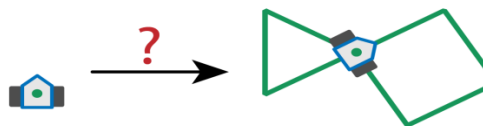
You can also give a sequence of commands to Drawbot:

For instance: **square, forward, triangle**

The image on the right shows what will happen:



Which sequence of instructions causes this to happen?



Write the letter of the correct answer in the appropriate place on your answer sheet.

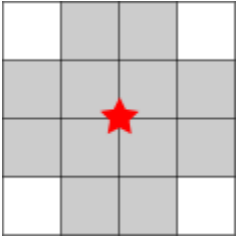
- A:** square, turn, forward, triangle
- B:** triangle, turn, square
- C:** triangle, turn, forward, square
- D:** square, forward, square, turn, triangle

C2: Village Network

JC2 / IB5 / SB2

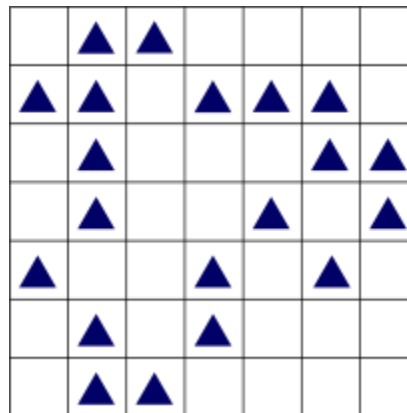
A village is receiving a new wireless network consisting of several network towers. The network will offer WiFi to all the villagers.

Every network tower has the coverage area shown below. The star represents the network tower. Only in the twelve shaded squares surrounding the tower will a house get a WiFi signal.



The picture shows a map of the village divided into squares. Every triangle ▲ represents a house.

A network tower cannot be built inside a square, only on the cross point of the village squares. The coverage areas may overlap.



**What is the minimum number of network towers required to provide coverage to every house?
Enter the number in the appropriate box on your answer sheet.**

C3: Mobile Phones

JC3 / IC1 / SB3

The beaver family have three mobile phones but none of the batteries have any charge.

It takes 1 hour to fully charge a mobile phone but this does not need to be done all in one go.

The beaver family only have two mobile phone chargers in the house.

What is the shortest time they need to fully recharge the three phones? Write down the letter of the correct answer in the appropriate block on your answer sheet.

A: 3 hours

B: 2 hours

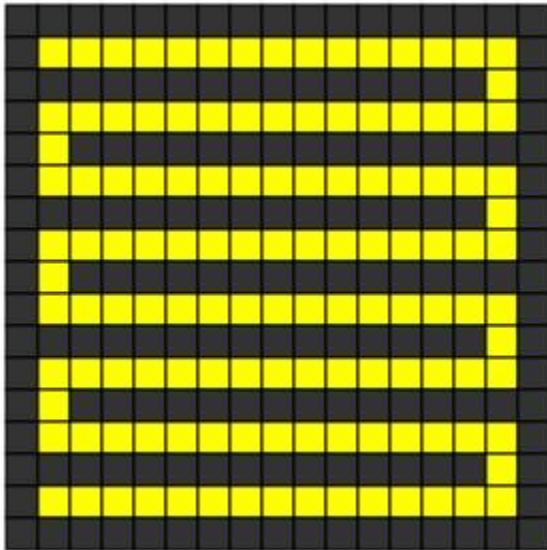
C: 1½ hours

D: 1 hour

C4: Monster

JC4 / IC3 / SC3

A monster lives in a room in the basement under a castle. The rooms in the basement are as shown as yellow/white blocks in the map below:



You have to find the monster. Your only help is the old lock-keeper, but when you show him a room on the map, and ask "Is this the right room?" he only answers "Search towards the first room" or "Search towards the last room".

What is the least number of questions you can ask before you are sure you have the right room? Write down the number in the appropriate block on your answer sheet.

C5: Clinging Robot

JC5 / IC5

The clinging robot walks along the road, always clinging to one side of the road. The clinging robot knows only four commands:

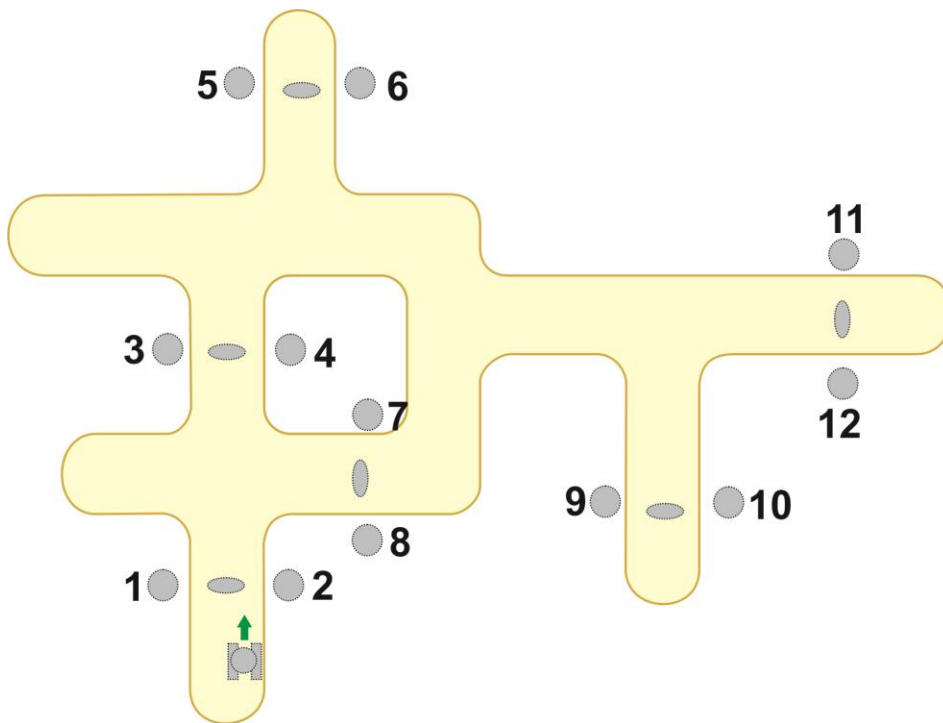
Command	Explanation
START	Start walking along the side where you are standing
CONTINUE	Keep walking along the side where you are walking
SWITCH	Switch to the other side of the road and keep walking
STOP	Stop walking

A command is executed whenever the robot walks across one of the grey oval magnetic strips on the road. All these strips are shown on the map.

The clinging robot is given the following instruction set:

- **START SWITCH CONTINUE CONTINUE CONTINUE STOP**

The robot starts where shown in the picture.



At which number will the robot stop? Write the number in the appropriate space on your answer sheet.