NOT TOO CLOSE

by *Frederique*
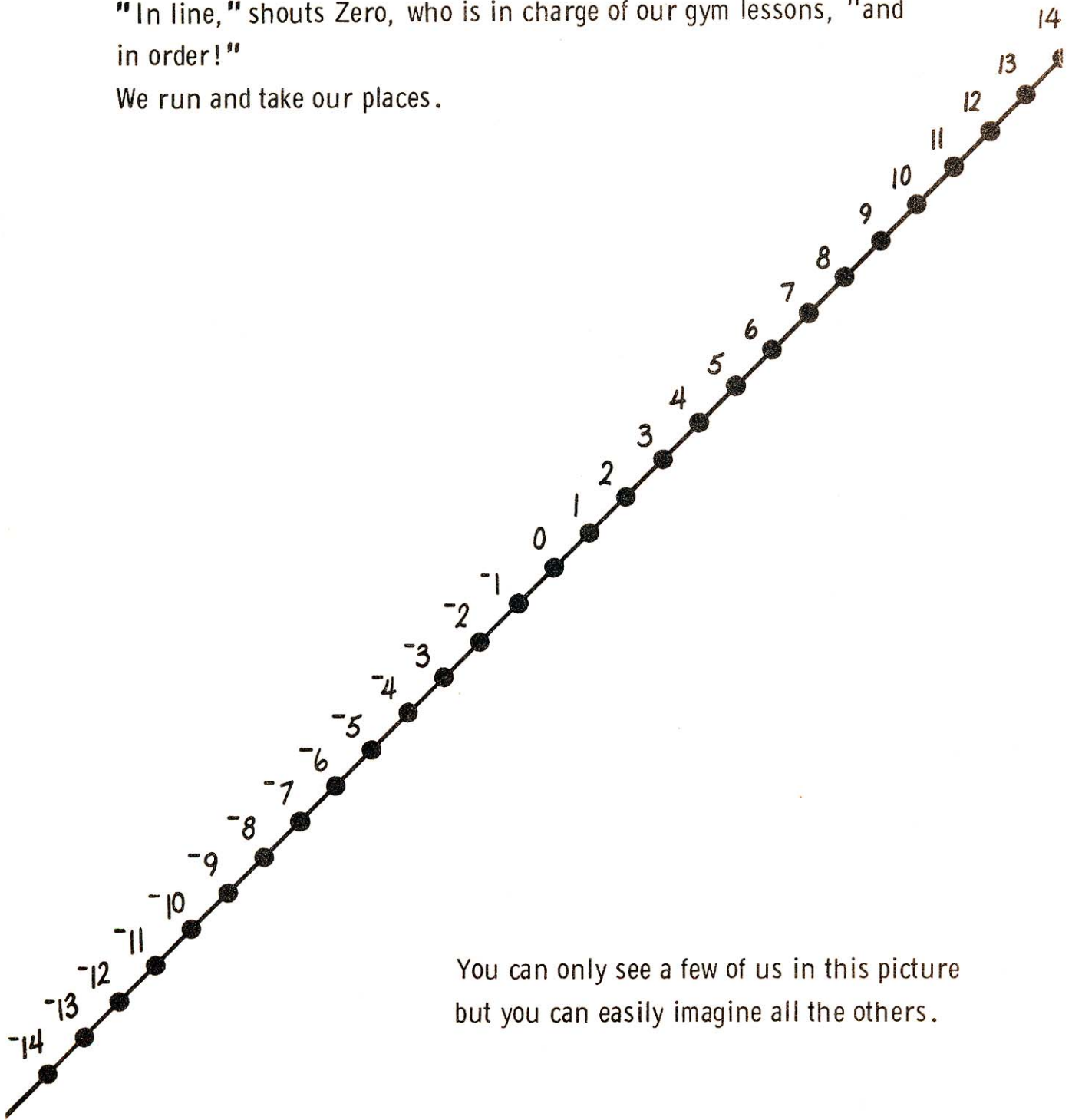
Design
ELLIOT GREEN

?

I shall not introduce myself to you.
You will find out who I am by reading my book.

I am doing some physical exercises on our school playground with my
friends the integers.

"In line," shouts Zero, who is in charge of our gym lessons, "and
in order!"

We run and take our places.

You can only see a few of us in this picture
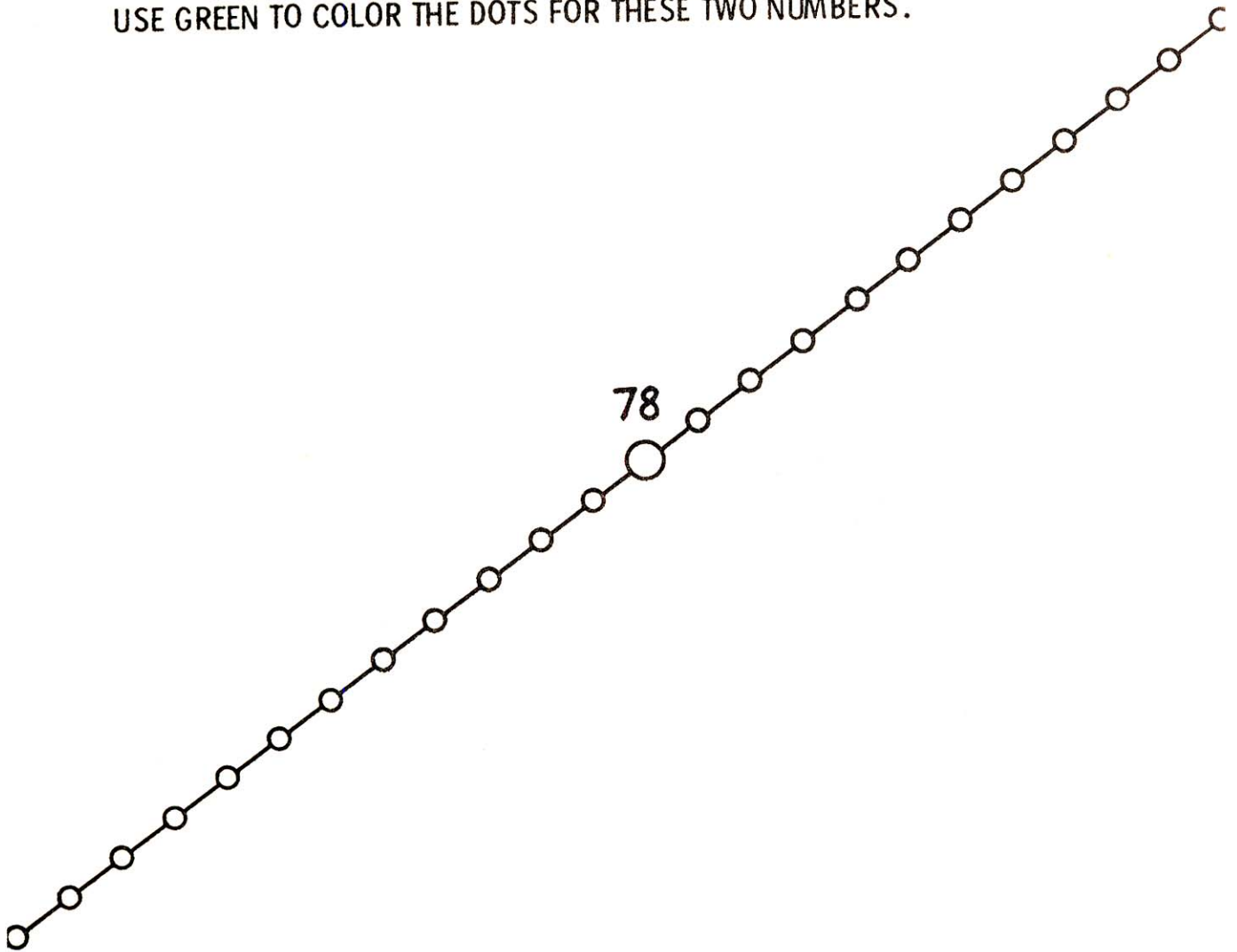but you can easily imagine all the others.

Looking at 78, Zero orders,
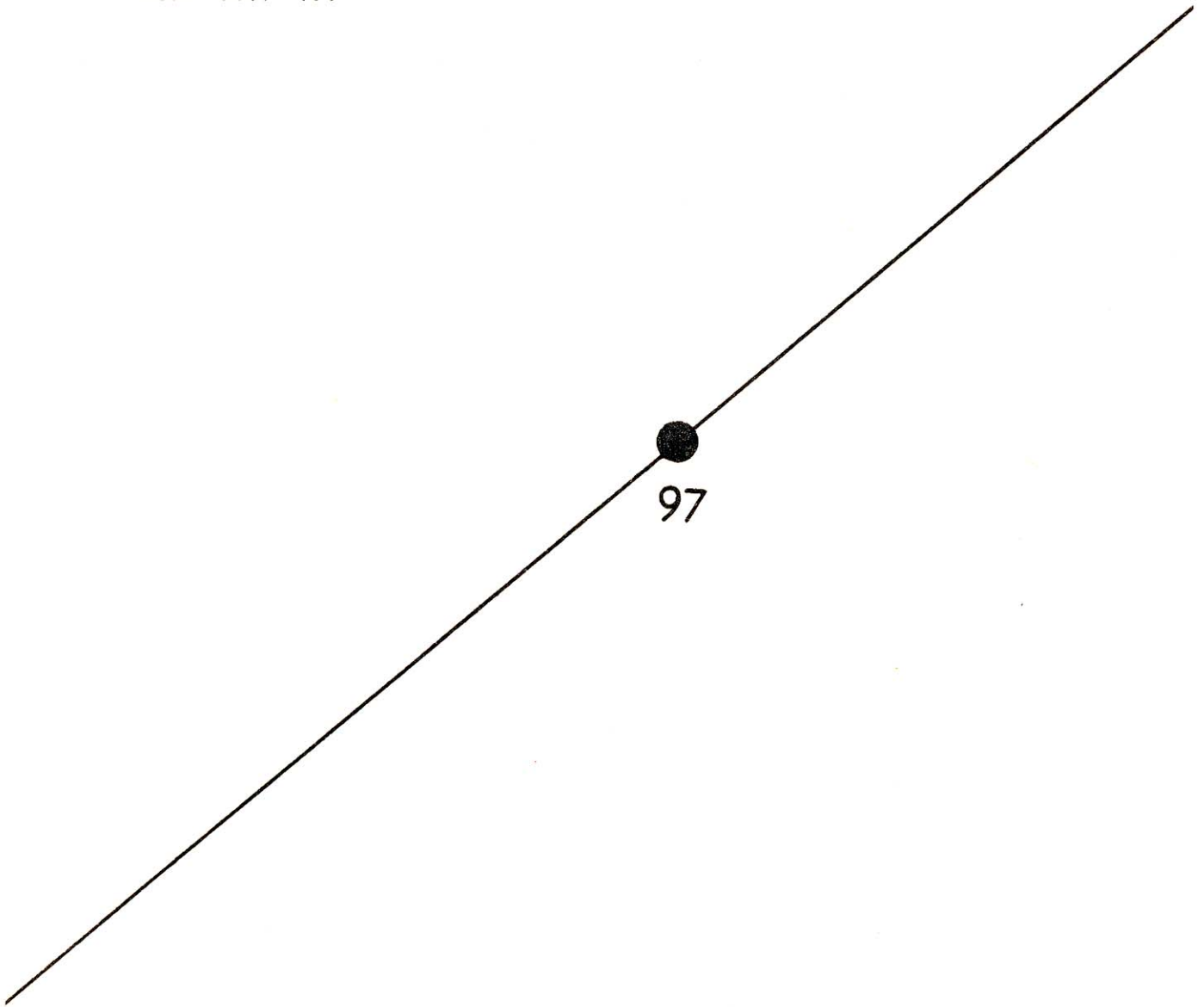"Throw a ball to each number whose distance from you is exactly 5."
78 thinks for a while. Then he throws a ball to

_____ and to _____.

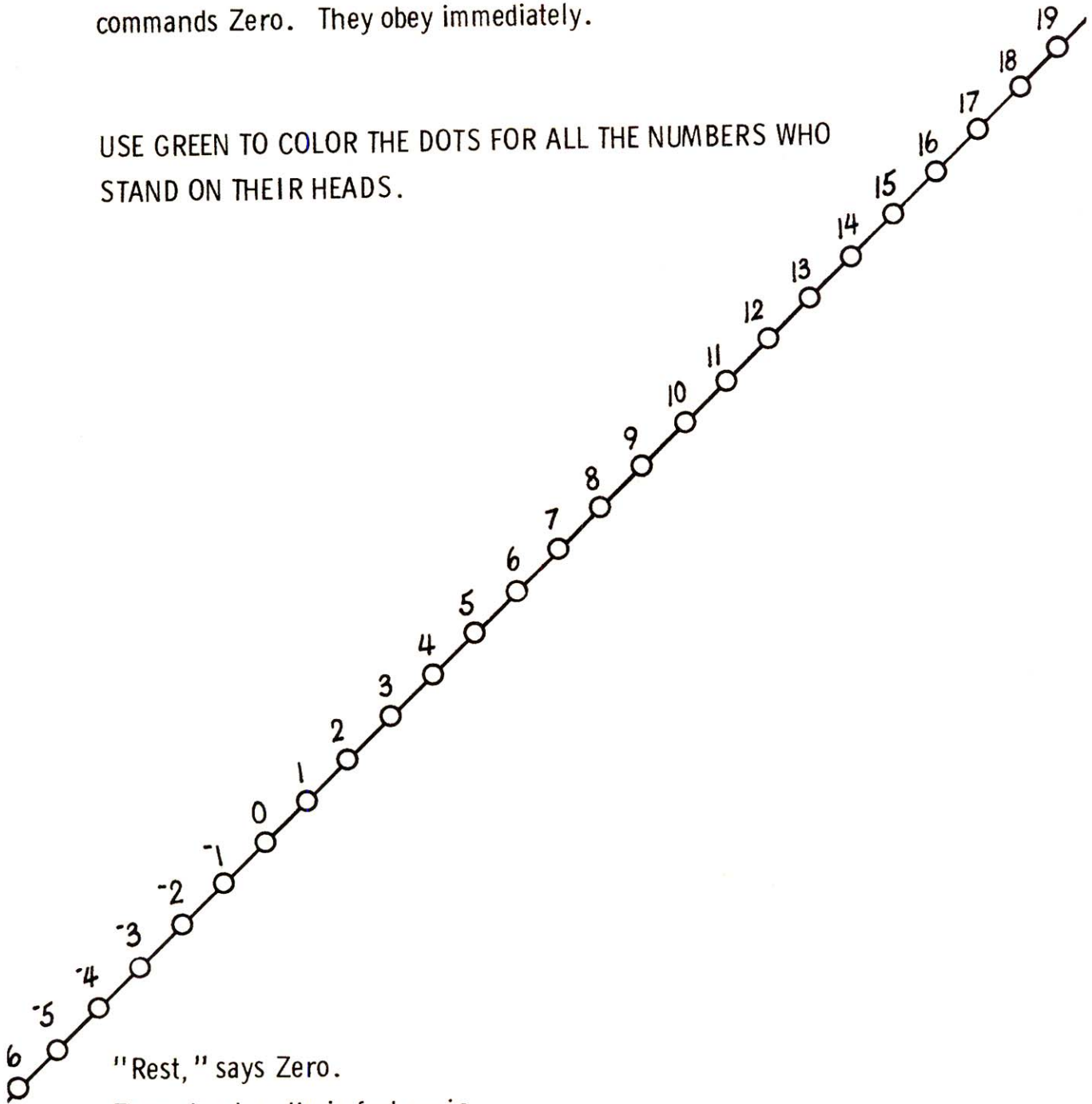USE GREEN TO COLOR THE DOTS FOR THESE TWO NUMBERS.

78

6

"Throw a ball to the numbers whose distance from you is exactly 8!"
Zero orders 97.

97

COMPLETE THIS PICTURE SO THAT IT SHOWS WHAT 97 SHOULD DO.

"Everyone whose distance from 6 is less than 10, stand on your head!"
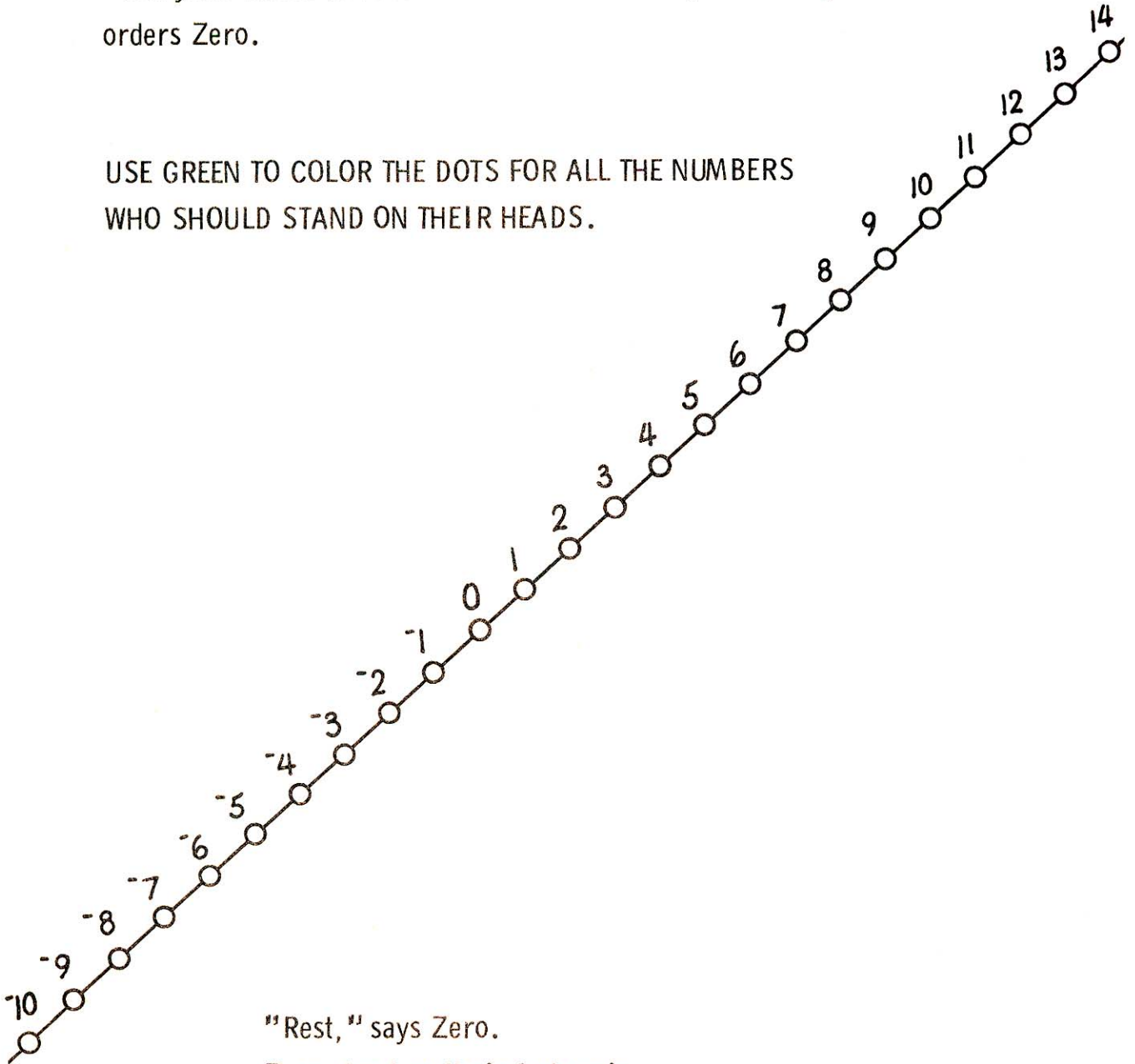commands Zero.   They obey immediately.

USE GREEN TO COLOR THE DOTS FOR ALL THE NUMBERS WHO
STAND ON THEIR HEADS.

19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
-1
-2
-3
-4
-5
6

"Rest," says Zero.
They stand on their feet again.

8

"Everyone whose distance from 2 is less than 7, stand on your head!"
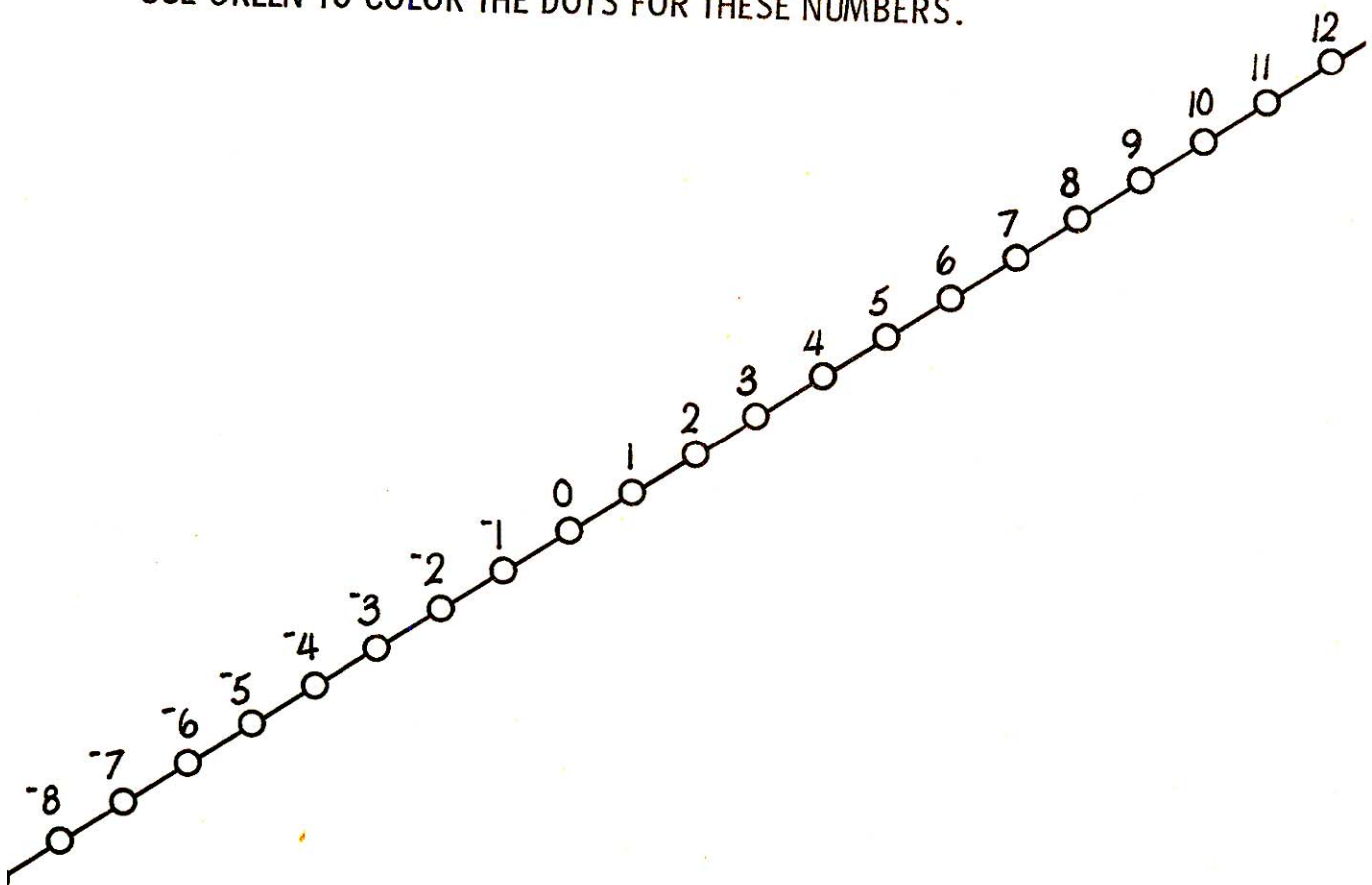orders Zero.

USE GREEN TO COLOR THE DOTS FOR ALL THE NUMBERS
WHO SHOULD STAND ON THEIR HEADS.

"Rest," says Zero.
They stand on their feet again.

Zero gives a similar order to all the numbers whose distance from 1 is more than 4.

USE GREEN TO COLOR THE DOTS FOR THESE NUMBERS.

These numbers are either larger than _____ or smaller than _____ .
You weren't able to draw them all because there are too many of them.
But you can imagine all the rest.

"I need two numbers whose distance from each other is 6," says Zero.
Four pairs of numbers volunteer:

19 and 25

32 and 26

‾4 and 2

‾14 and ‾20

WRITE BELOW SOME OTHER PAIRS OF NUMBERS WHO COULD HAVE
VOLUNTEERED.

_____ and _____   _____ and _____

_____ and _____   _____ and _____

_____ and _____   _____ and _____

_____ and _____   _____ and _____

CAN YOU THINK OF CERTAIN NUMBERS WHO COULD PLAY IN THIS WAY?
WRITE THEIR NAMES ON THESE PICTURES.
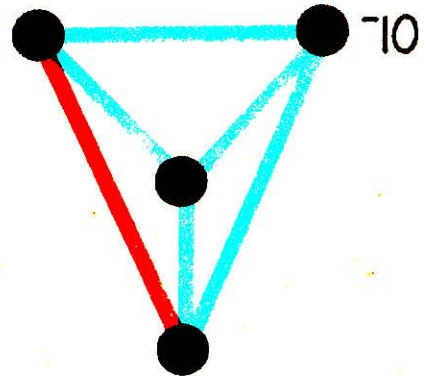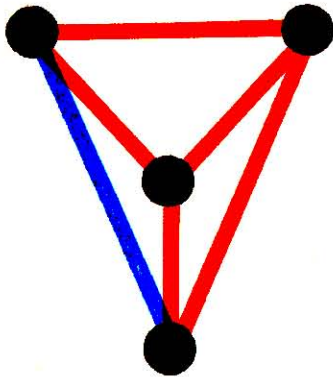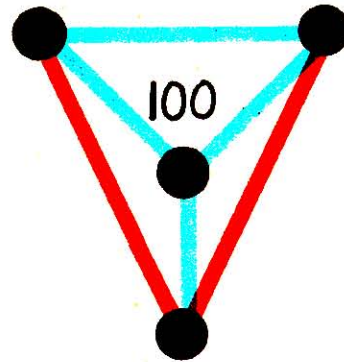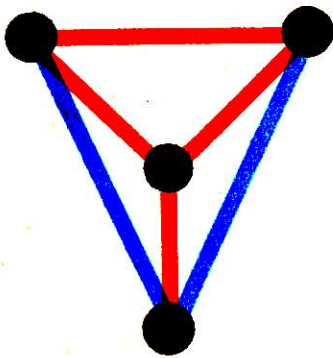
We did many more physical exercises but it would be too boring to tell you about them all. After the gym lesson, we had a break of an hour during which we could read, draw pictures, and write. While I was drawing, I invented a new game which I shall explain to you on the next few pages.

IN MY GAME

Two numbers are joined by a red cord
if and only if
the distance between them is less than 10.

WHICH NUMBERS COULD THESE DOTS BE FOR? THINK OF MANY
SOLUTIONS AND WRITE THEM ON A SEPARATE SHEET OF PAPER.
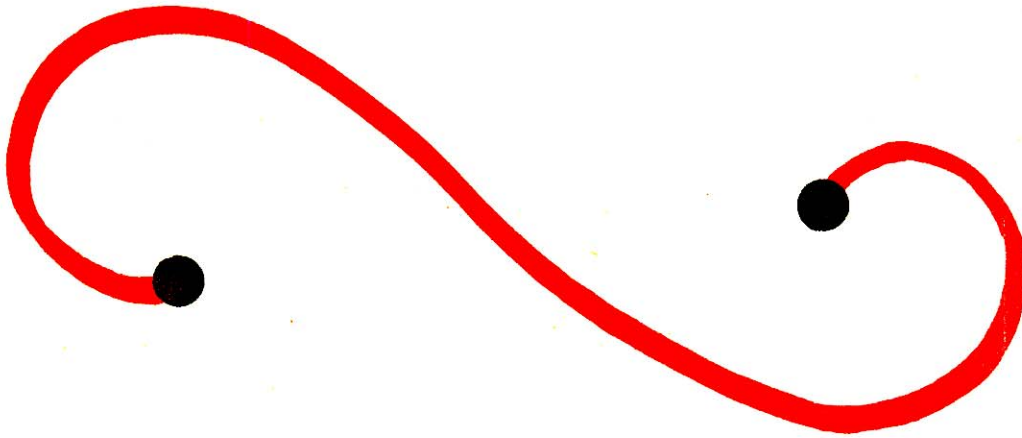
COULD THESE DOTS BE FOR

32 and 40? _____

17 and 7? _____

95 and 104? _____

998 and 1,006? _____

$^-4$ and 4? _____

5 and $^-5$? _____

4 and $^-14$? _____
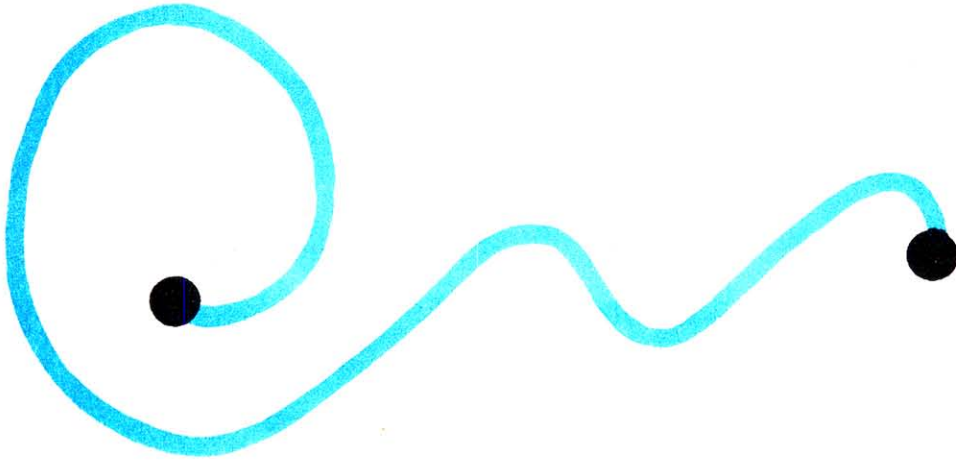
$^-4$ and $^-14$? _____

$^-5$ and $^-14$? _____

Here are some of my friends. They began to play my game but did not
have the time to finish it.
CAN YOU DRAW THE REST OF THE RED CORDS FOR THEM?

16

20

9

$^-$15

2

$^-$20

$\overset{\wedge}{7}$
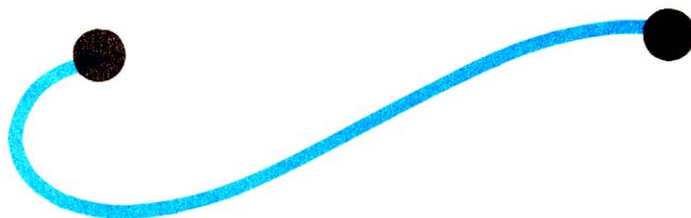
993

9,997

1,001

10,005
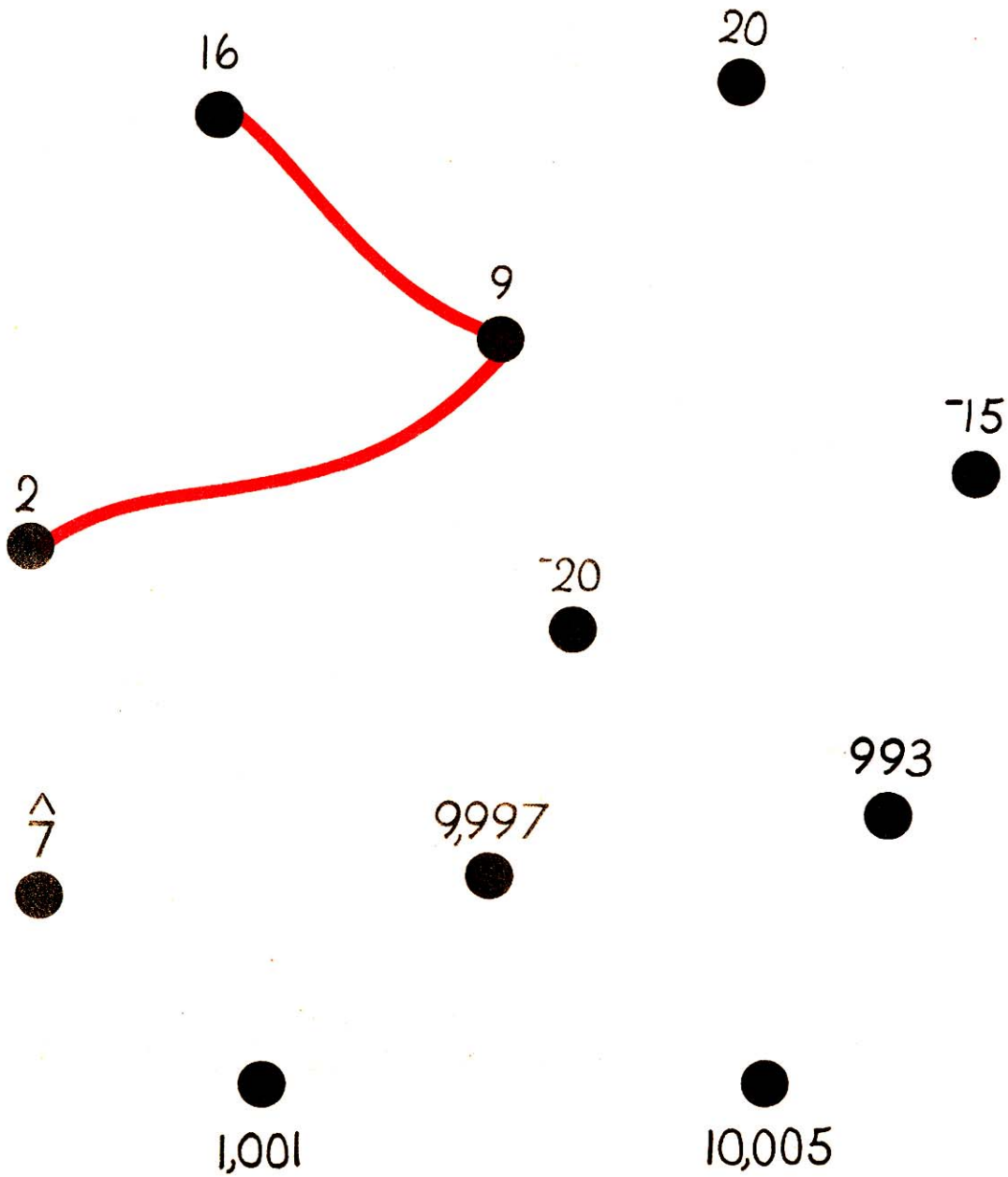
IN MY GAME,

Two numbers are joined by a blue cord
if and only if
their distance is 10 or more than 10.

WHICH NUMBERS COULD THESE DOTS BE FOR? THINK OF MANY
SOLUTIONS AND WRITE SOME OF THEM ON A SEPARATE SHEET OF PAPER.

COULD THESE DOTS BE FOR

5	and	21?	_____
8	and	⁻8?	_____
995	and	1,003?	_____
⁻8	and	⁻1?	_____
⁻18	and	⁻11?	_____
⁻18	and	11?	_____
9,995	and	10,005?	_____

On this picture, I have drawn three blue cords. Many more are missing.
TRY TO DRAW THEM ALL.

1,000

991

⁻10
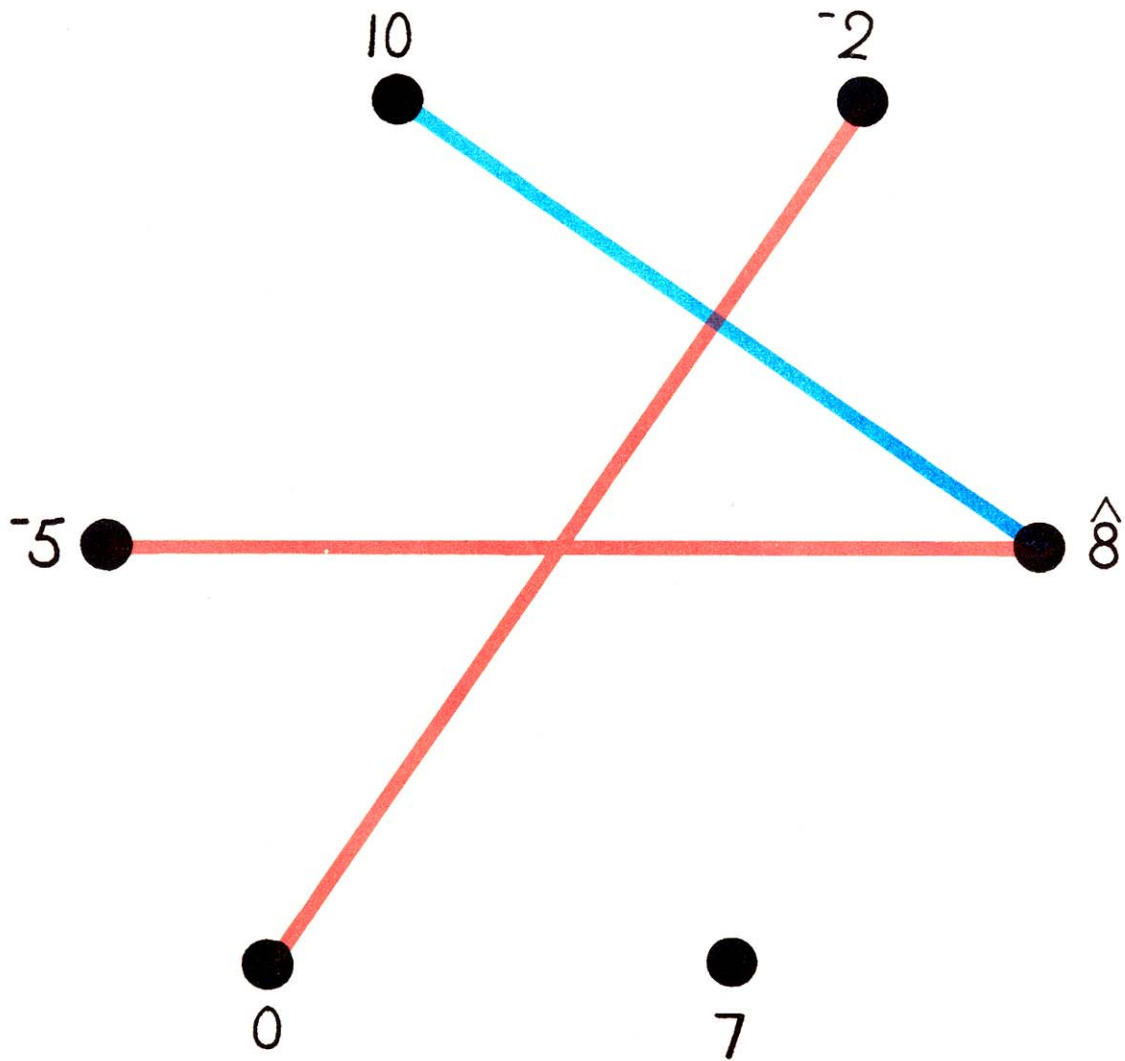
1,010

1,001

⁻1

100

∧
=

∧
8

0
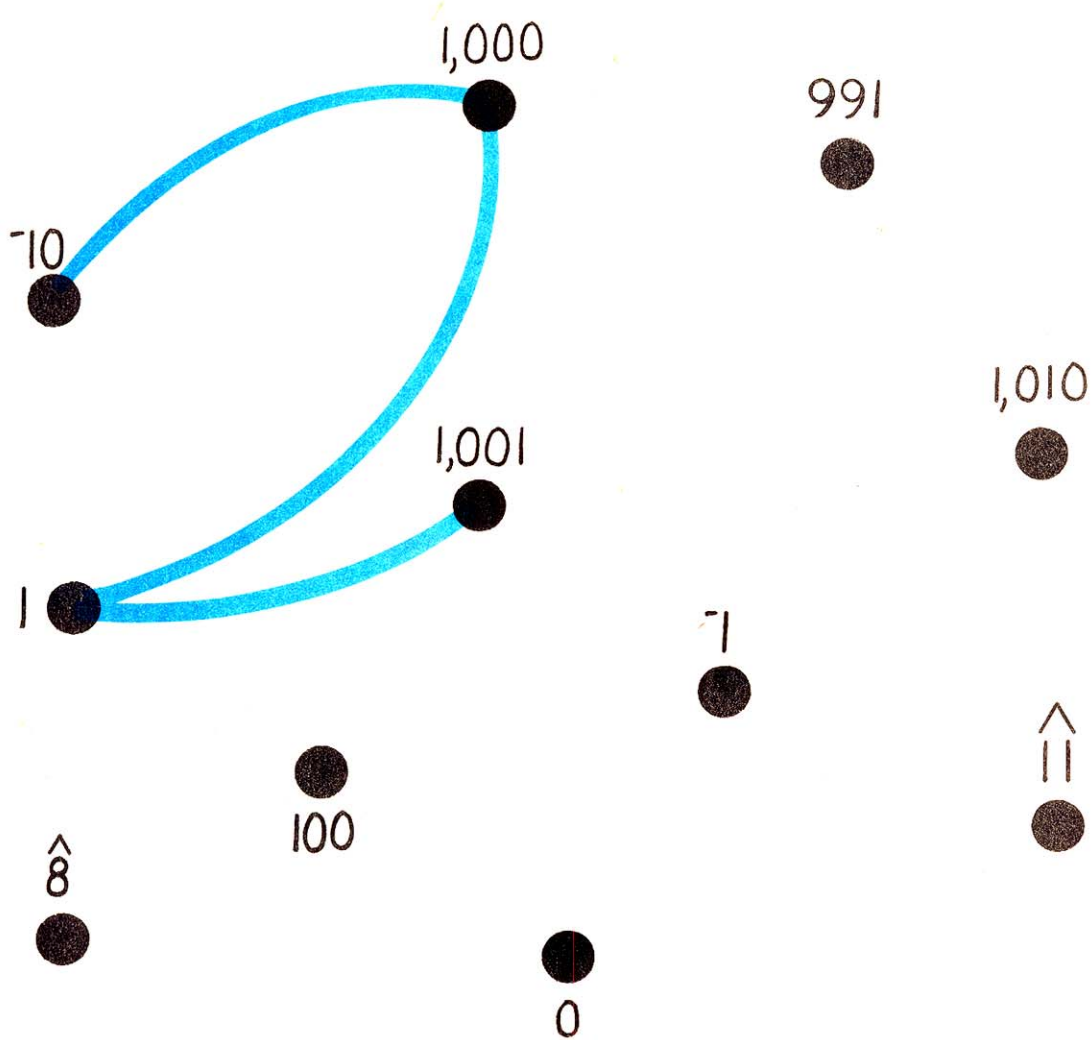
WE COULD ADD SOME RED CORDS TO THIS PICTURE.
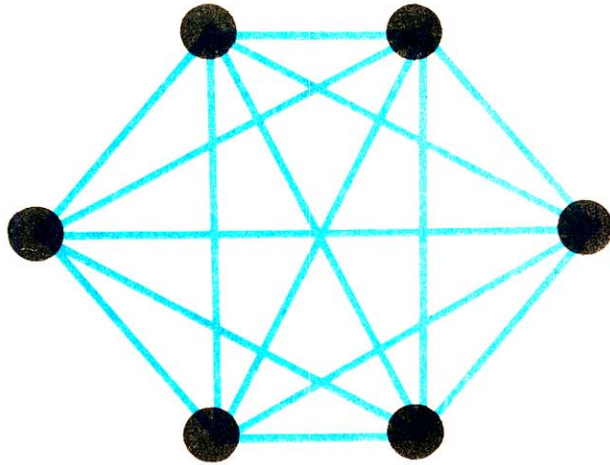TRACE SOME OF THEM WITH YOUR FINGER, BUT DON'T DRAW THEM.
WHAT DO YOU NOTICE?

DRAW ALL THE RED CORDS AND ALL THE BLUE CORDS THAT ARE POS-
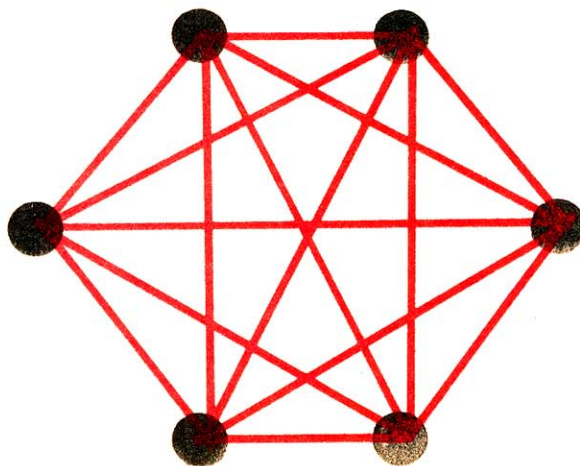SIBLE BETWEEN THESE NUMBERS.

WHAT DO YOU NOTICE?

In the picture on page 18, some cords are red and some cords are blue.
CAN YOU THINK OF SIX NUMBERS THAT CAN BE JOINED USING ONLY
BLUE CORDS? WRITE THEIR NAMES ON THIS PICTURE.

CAN YOU THINK OF SIX NUMBERS THAT CAN BE JOINED USING ONLY
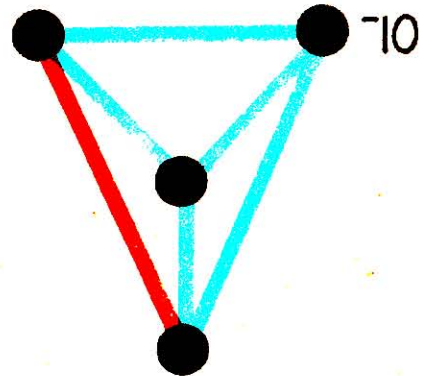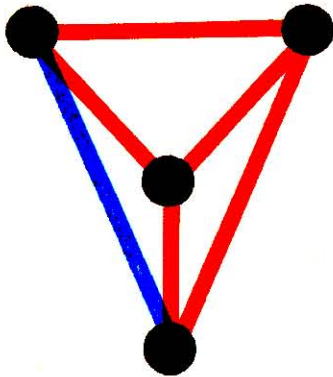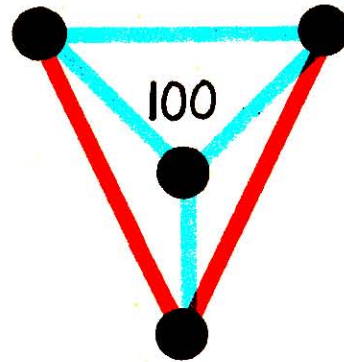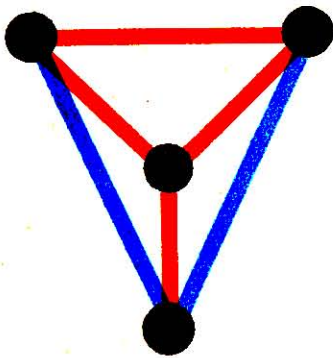RED CORDS? WRITE THEIR NAMES ON THIS PICTURE.

CAN YOU THINK OF FOUR NUMBERS WHO COULD PLAY MY GAME IN
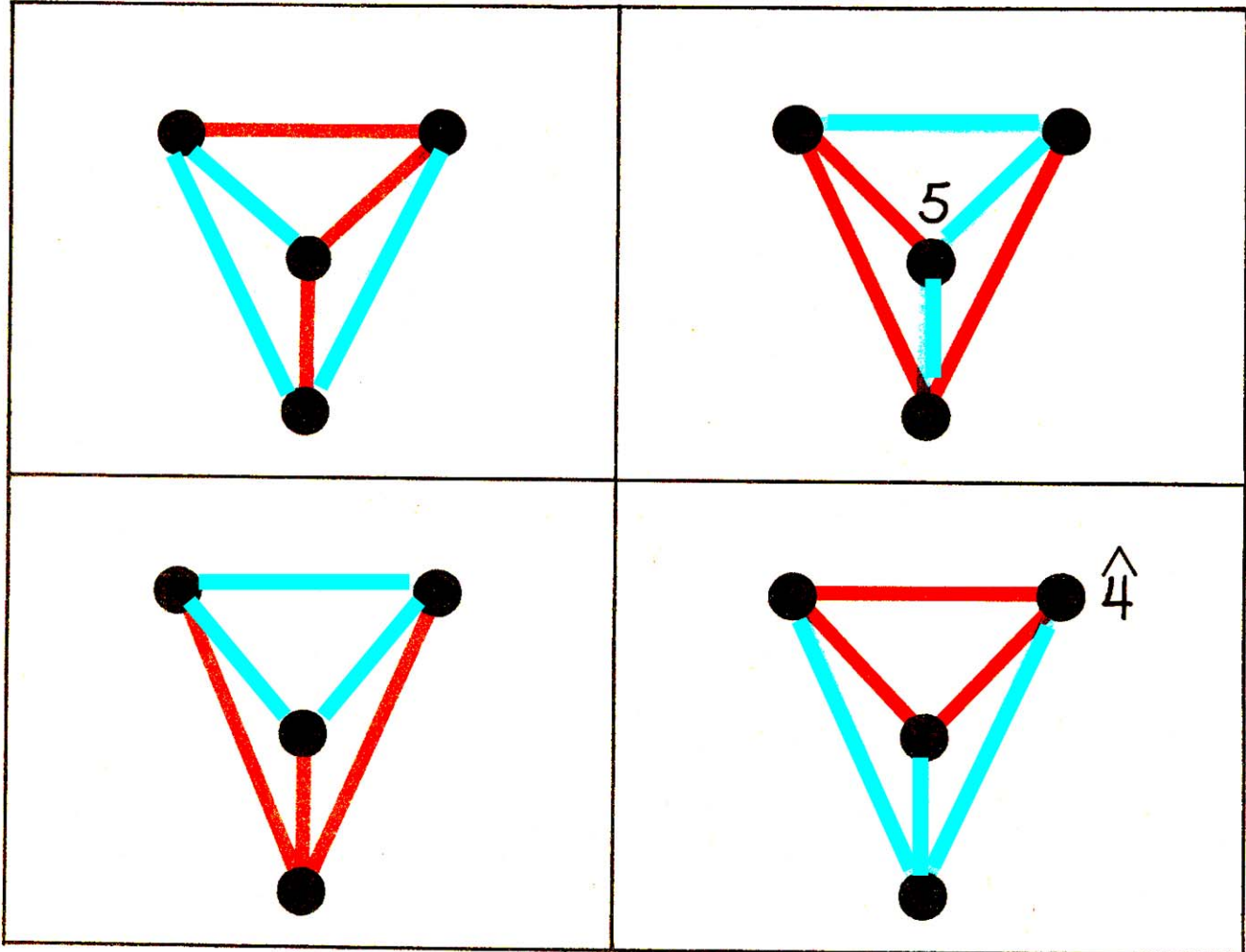THIS WAY? WRITE THEIR NAMES ON THE PICTURE.
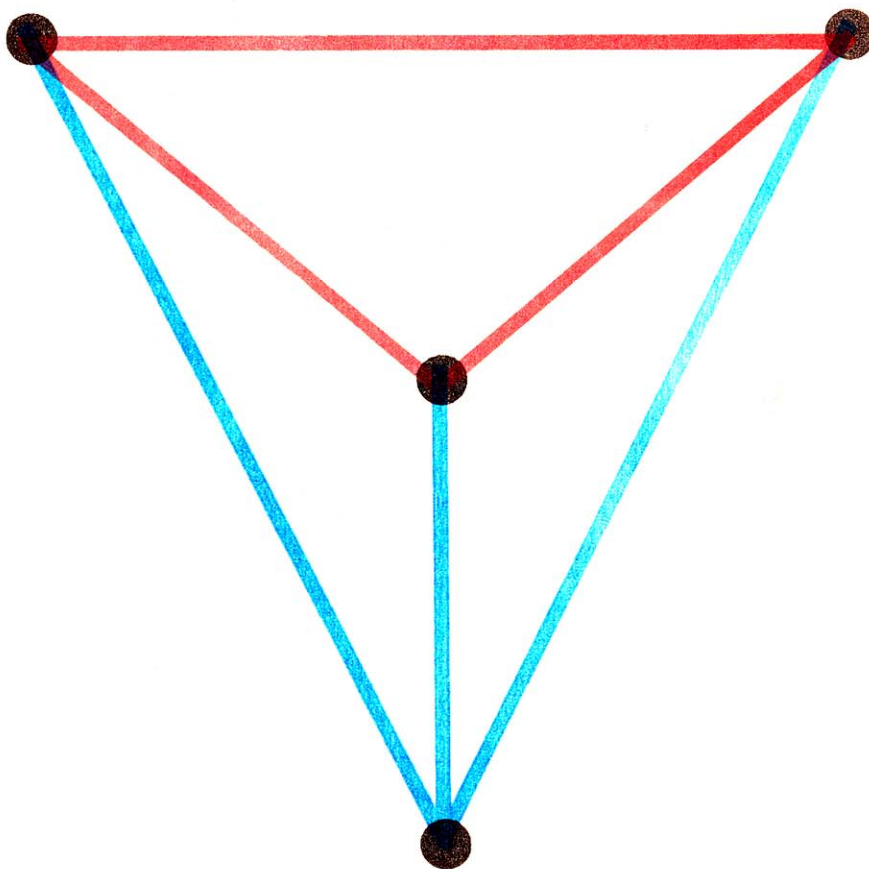
YOU COULD EASILY FIND MANY OTHER SOLUTIONS.
DRAW SOME OF THEM ON A SEPARATE SHEET OF PAPER.

CAN YOU THINK OF CERTAIN NUMBERS WHO COULD PLAY IN THIS WAY?
WRITE THEIR NAMES ON THESE PICTURES.

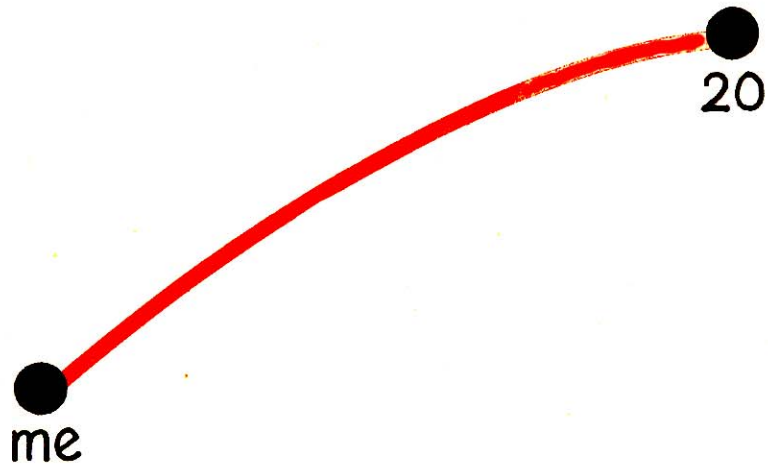AND WHAT ABOUT THESE FOUR PICTURES?
TRY TO LABEL THEIR DOTS.

DID YOU FIND THAT ONE OF THESE PICTURES IS WRONG?
IT'S IMPOSSIBLE TO PLAY THE GAME ACCORDING TO THE PICTURE IT
SHOWS. CROSS IT OUT.

You still don't know who I am.

Now I shall give you some clues to help you discover who I am.

┌─────────────────────┐
│ **First clue:**   │
└─────────────────────┘
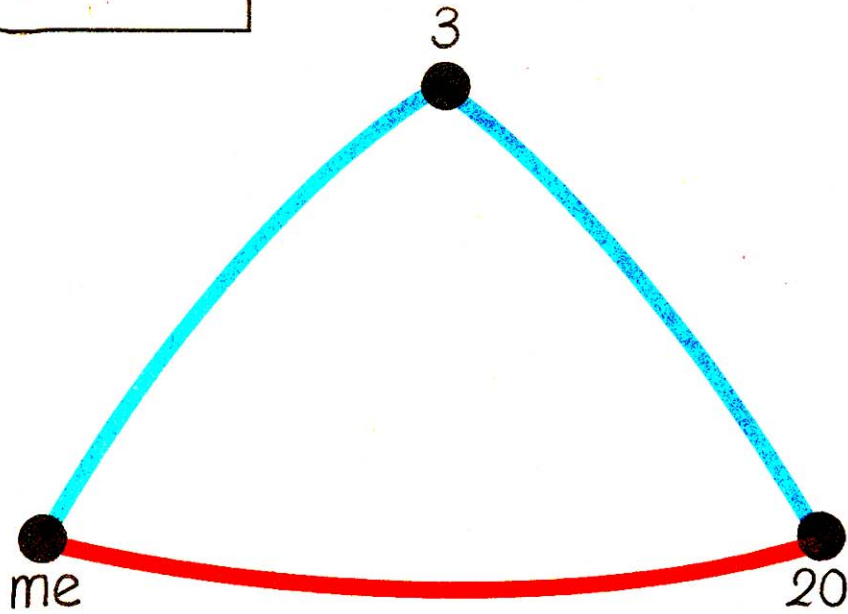

Could I be 25? _____

Could I be 14? _____

Could I be 30? _____

Could I be 0? _____

Could I be 10? _____

What is the largest number I could be ? _____

What is the smallest number I could be ? _____

Second clue:

3

me   20

Could I be 18? _____

Could I be 12? _____

Could I be 29? _____

What is the smallest number I could be? _____
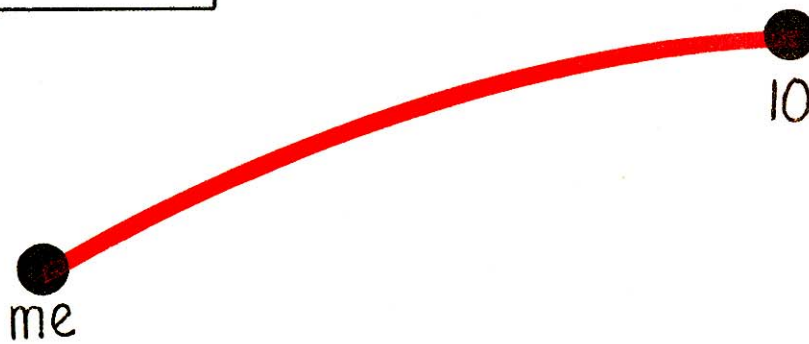
What is the largest number I could be? _____

Therefore I am larger than _____ and smaller than _____ .

Third clue:

10

me

You already know that I am larger than _____ and smaller than _____.

Could I be 12?   _____
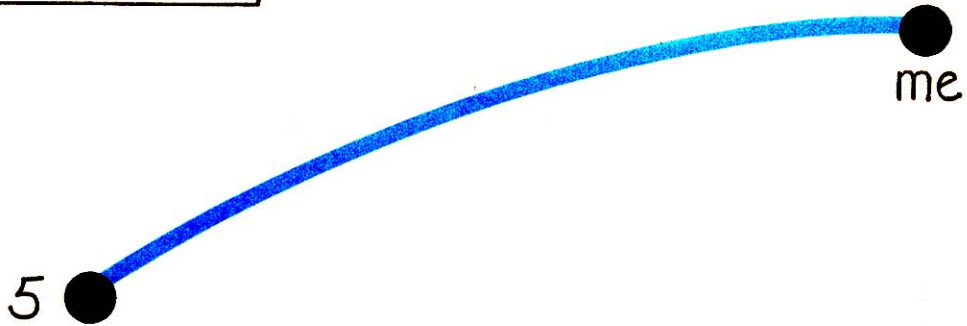
Could I be 13?   _____

Could I be 14?   _____

Could I be 20?   _____

Could I be 21?   _____

WRITE ALL THE NUMBERS THAT I COULD BE:

_____ ; _____ ; _____ ; _____ ; _____ ; _____ ; _____ .

Fourth clue:

5 ● ～～～ ● me
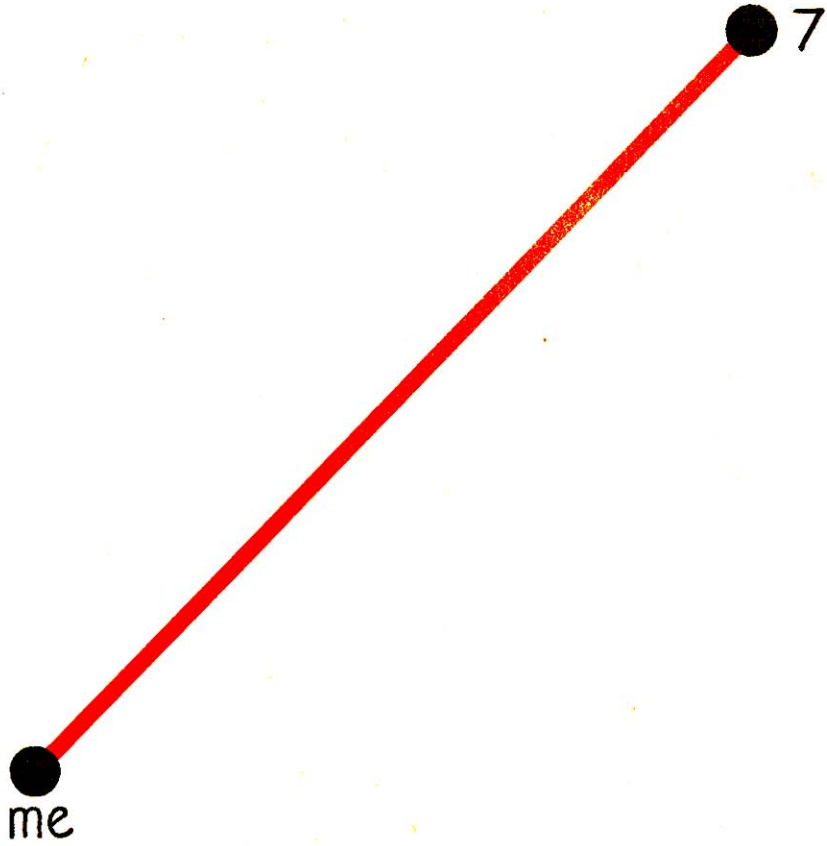
You already know that I am one of these seven numbers:

_____ ; _____ ; _____ ; _____ ; _____ ; _____ ; _____ .

The fourth clue tells you that two of them are impossible.
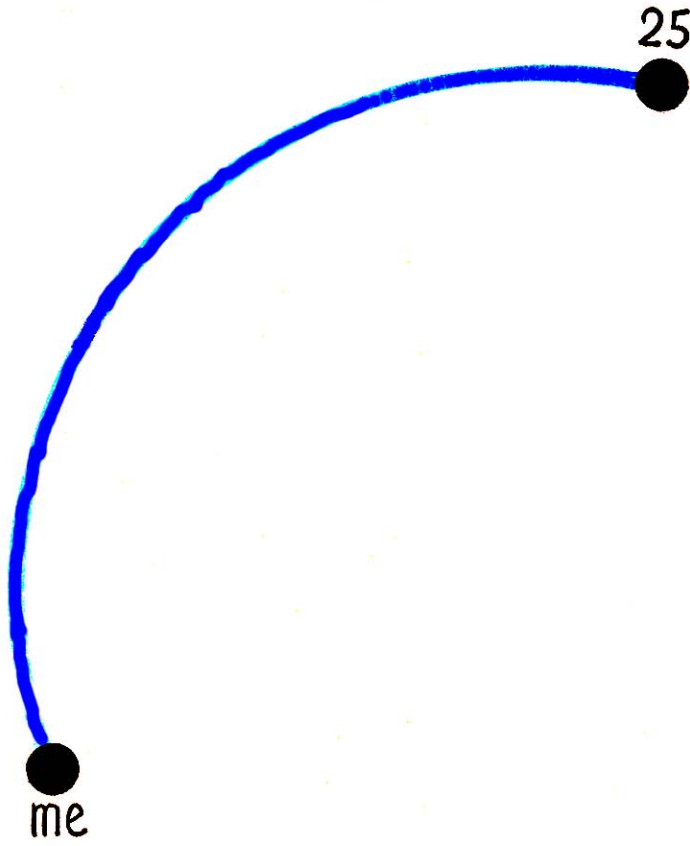
CROSS THEM OUT.

Fifth clue:

● 7

● me

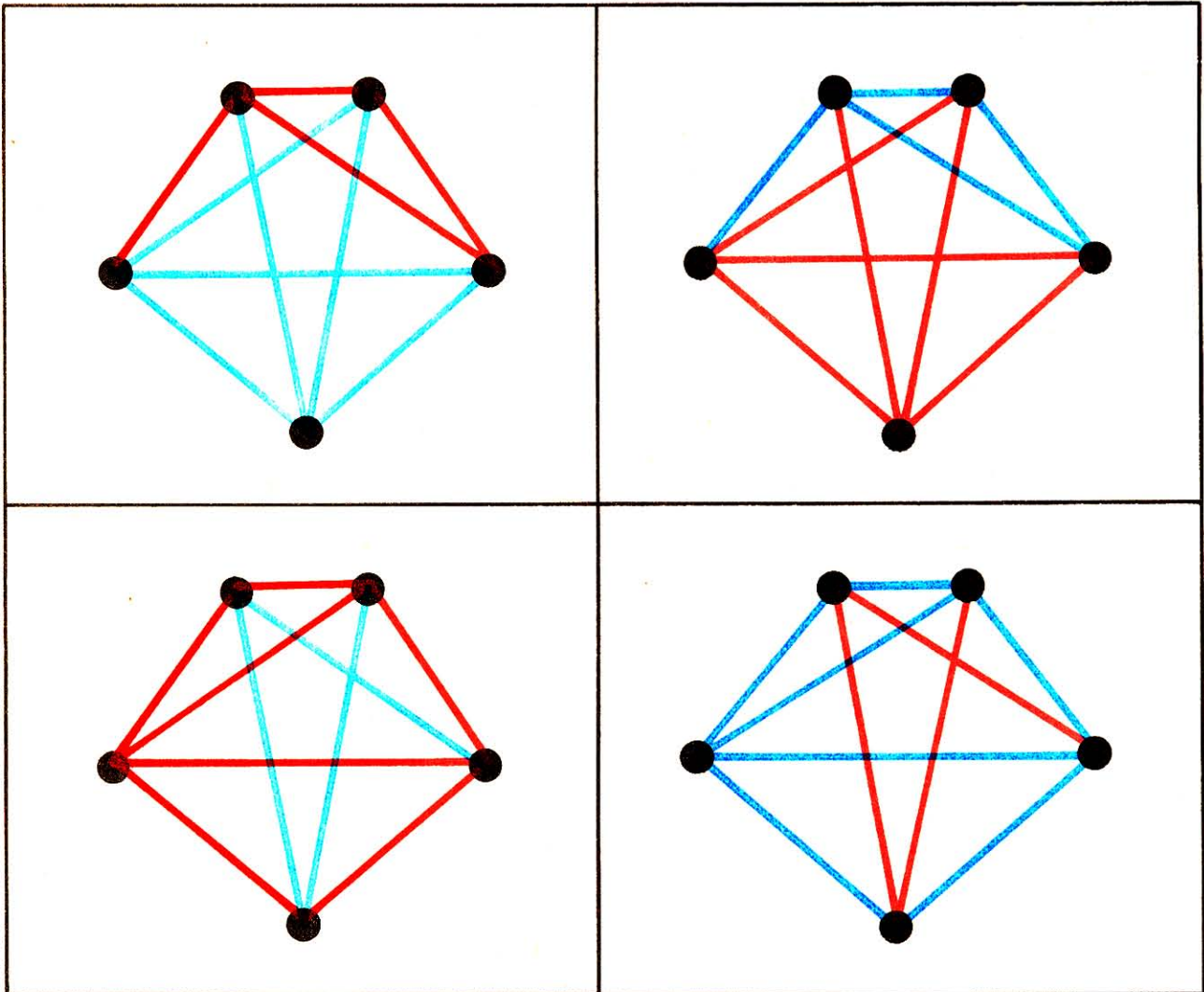Now you know that I am

_____ or _____

Sixth clue:

25

me

Have you found out who I am?

I am _____.

My friends played my game all day long. Very soon the walls of the
school were covered with red and blue posters. Here are some of them.
TRY TO LABEL THEIR DOTS.

Did you discover that one of these posters is wrong?
It's impossible to play the game according to the picture it shows.
Cross it out.

INVENT SOME PROBLEMS FOR YOUR CLASSMATES BY DRAWING YOUR
OWN RED AND BLUE PICTURES. BE SURE THAT YOU CAN SOLVE THEM
YOURSELF!

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