

by Federica

Pictures/Design  
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Vince Brown

Tomorrow is going to be a marvelous day; it is Valentine's Day. I called my best friend, the number Zero, to share my excitement.

"Tomorrow we will have a big party at school," I said. "We have made up strange songs, wild dances, new games, and funny stories for the party. The school band will play and the theater will be decorated with large pictures that we have drawn ourselves. At the end of the celebrations, we will exchange valentines."

It will be a great day!

"In the World of Numbers, we have different customs for Valentine's Day," said Zero. "Each year, we challenge the human beings by inventing a game that can only be played by numbers."

I was puzzled.



“What game did you invent?” I asked.

“If you explain it to me clearly, I bet that tomorrow I can play it with my friends at school.”

Zero laughed.

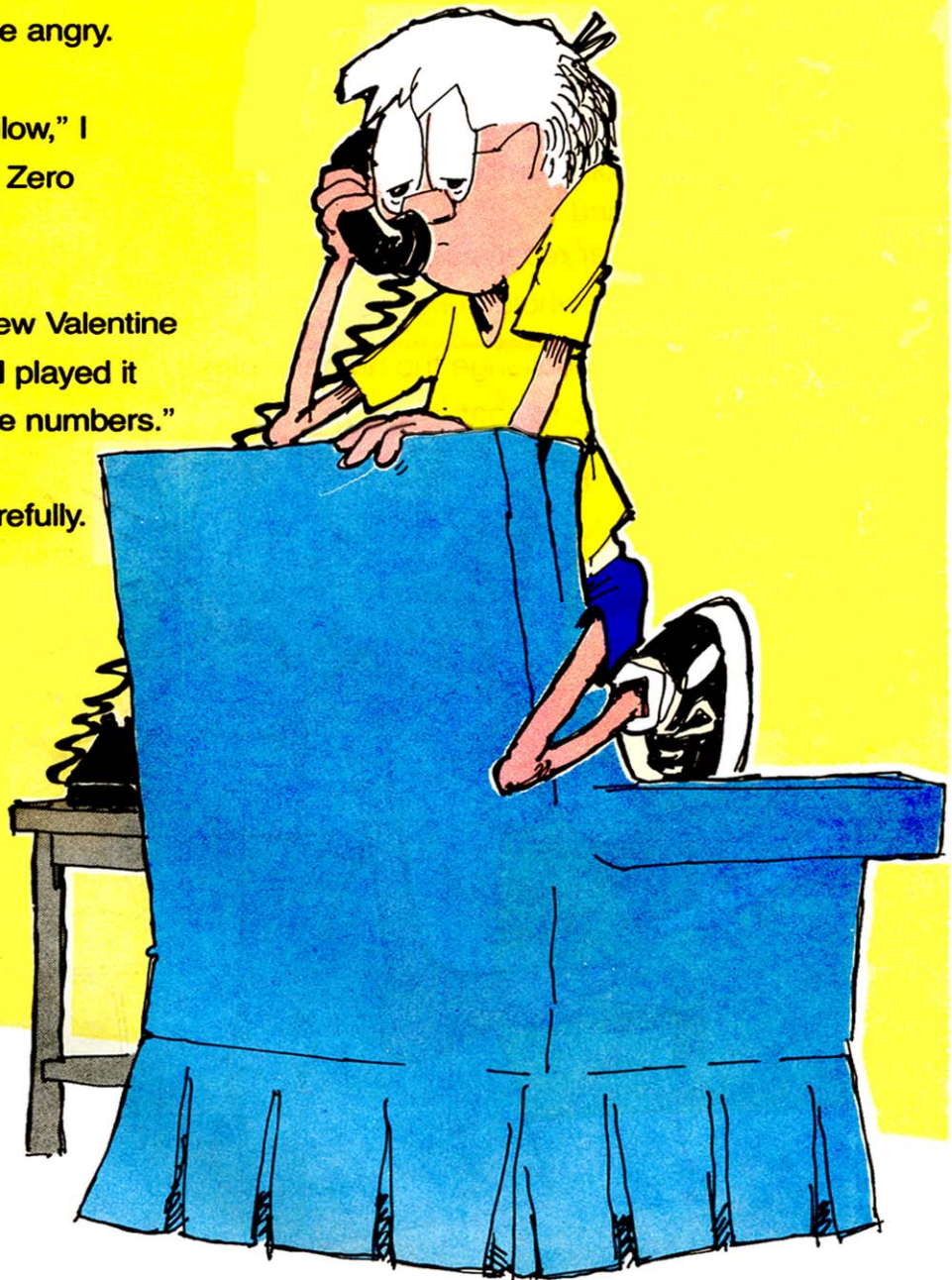
“You poor human being! You don’t seem to realize the power of the numbers.”

I was confused and a little angry.

“Zero is an interesting fellow,” I thought. “But sometimes Zero is a show-off.”

“I am the author of the new Valentine Game,” said my friend. “I played it today with all of the whole numbers.”

I started to listen very carefully.



"You know that I don't like to write letters but that I enjoy receiving lots of them," said my friend.

"That's true," I observed. "When you travel, you always forget to send me a postcard."

"I am lazy," agreed Zero. "But I like to make people happy. So in my new game:

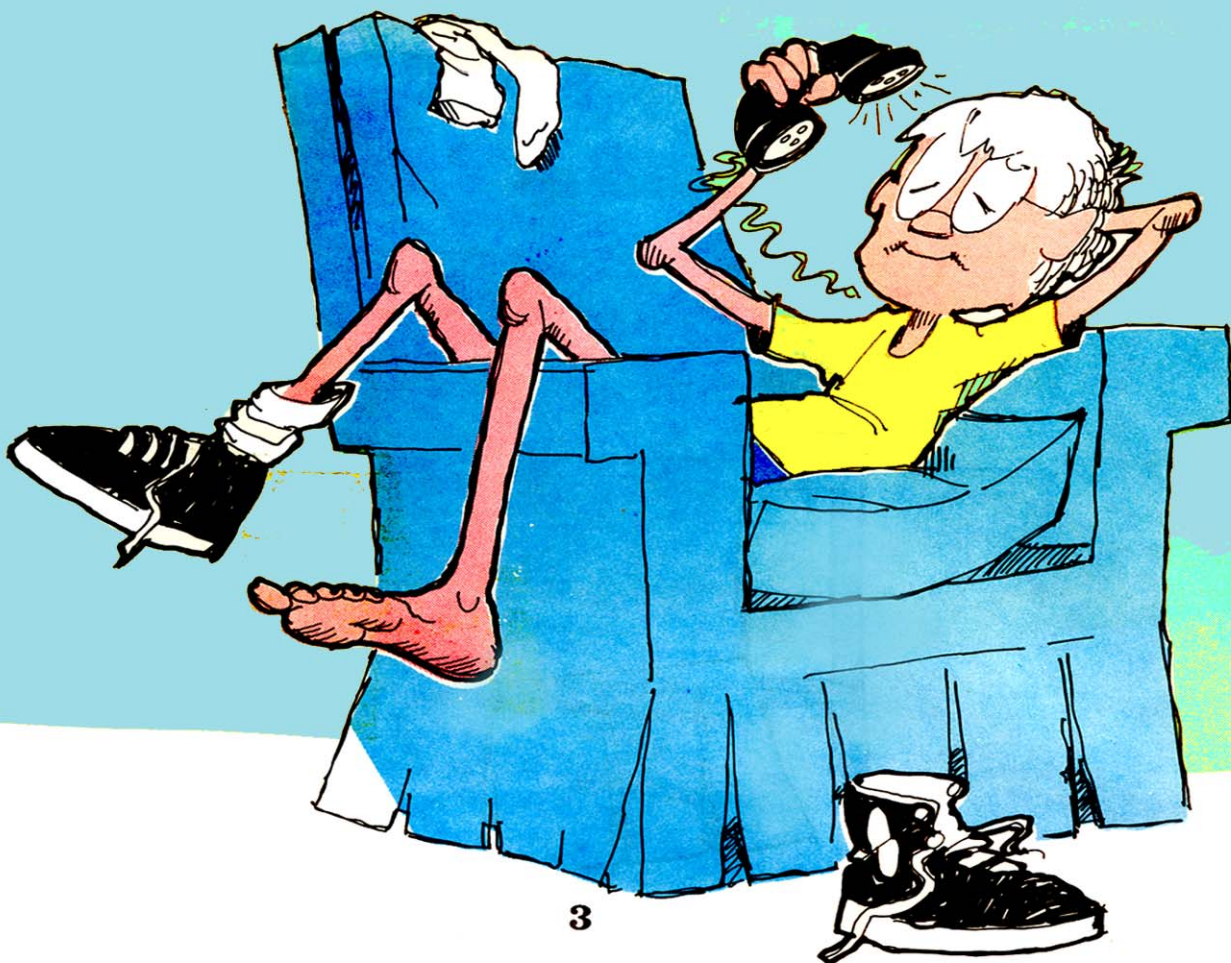
Each whole number sends exactly one valentine to a whole number and each whole number receives exactly ten valentines from ten whole numbers."

"You must be joking," I said. "Let us pretend that I play this game with all of the pupils in my class. There are 25 of us.

"If each person writes one letter, then altogether we send exactly 25 letters.

"But if each person has to receive 10 letters, we need 250 letters.

"Your game doesn't make any sense."



"Now slow down a minute," advised my friend. "Don't forget that we are not people. We are numbers. We are very powerful."

"That's easy to say," I replied, "But you will have to convince me that it is true."

"Okay," said Zero. "But I cannot do it on the phone. I will have to draw some pictures to make the game clear. Are you free tomorrow after school?"

"Yes. I shall expect you at 4 P.M."

"Bye, Bye. Sleep well. Don't dream too much of my game."



The next day, at 4 p.m.

The doorbell rang. It was my friend carrying a bundle of posters. Zero was relaxed and very confident as usual. We put one of the posters on the floor.

“Look and think,” said Zero.

I was silent for a while.

“Do you understand the rule of my game?” asked Zero.

**SENDS A VALENTINE TO**

→

|           |   |         |
|-----------|---|---------|
| 0         | → | 0       |
| 6         | → | 0       |
| 27        | → | 2       |
| 85        | → | 8       |
| 349       | → | 34      |
| 506       | → | 50      |
| 4,217     | → | 421     |
| 30,675    | → | 3,067   |
| 5,249,367 | → | 524,936 |

“You’re a selfish number,” I said laughingly. “You send a valentine to yourself and to nobody else in this game.”

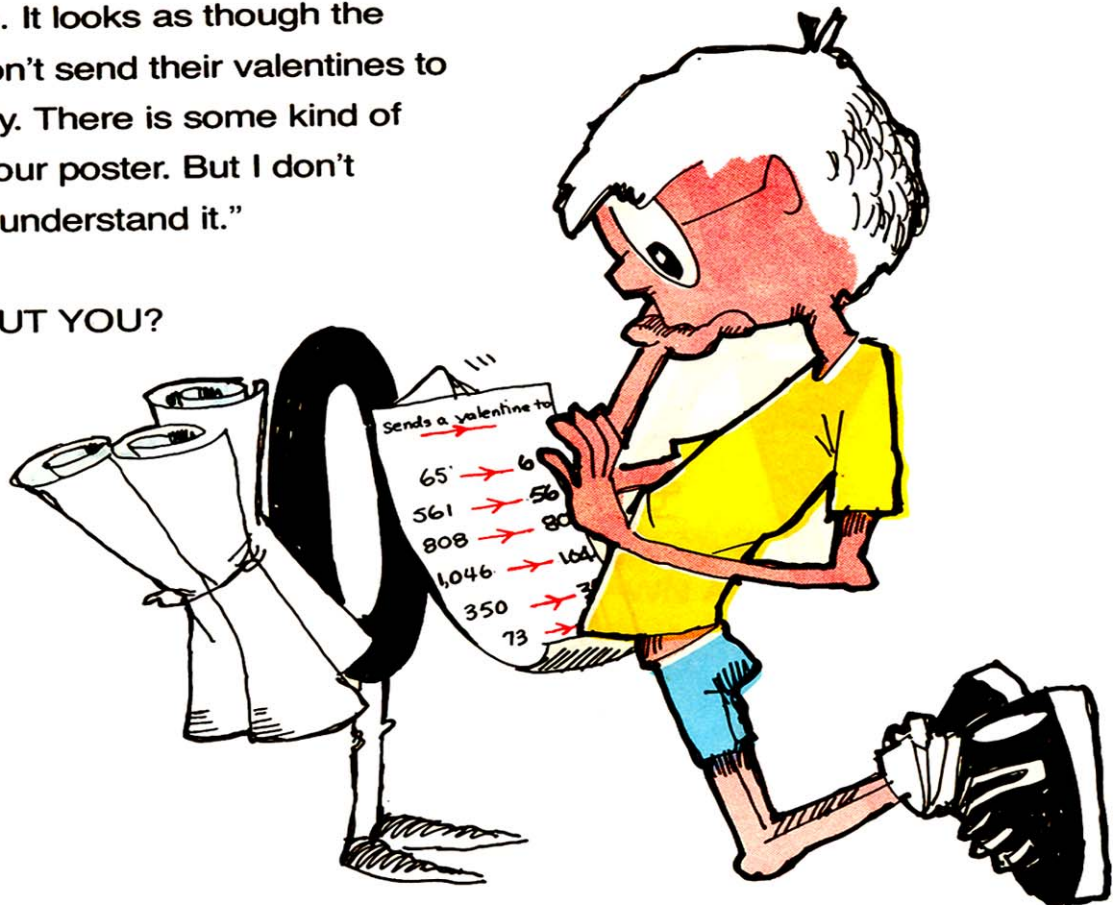
“That’s true,” agreed Zero. “But I only did it so that my game would succeed. Look carefully at the whole poster and try to find out something much more interesting.”

“You receive a valentine from 6,” I observed. “So you get at least two valentines.”

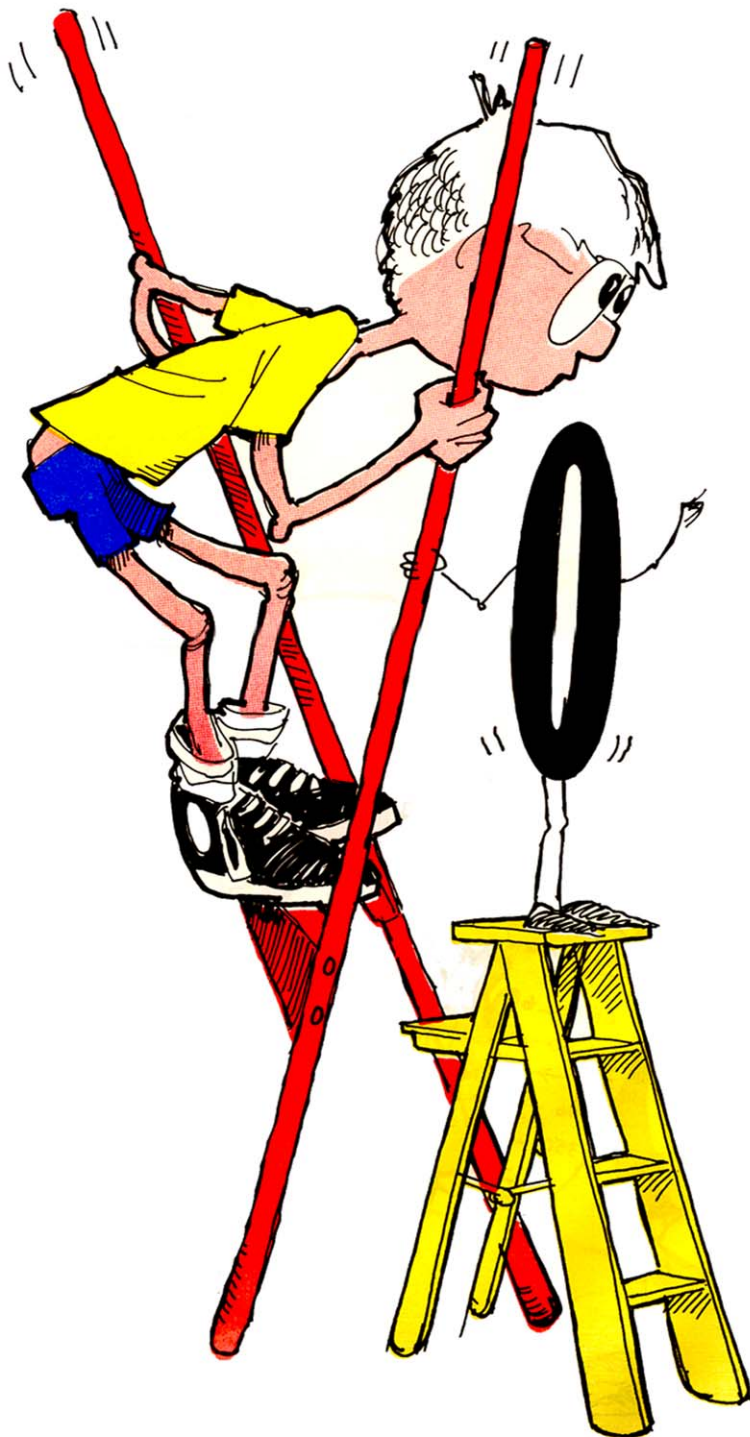
“Don’t think only of me,” advised my friend.

“It’s strange. It looks as though the numbers don’t send their valentines to just anybody. There is some kind of pattern in your poster. But I don’t completely understand it.”

HOW ABOUT YOU?



"Look at these new posters," said Zero.



sends a valentine to

$$74 \longrightarrow 7$$
$$74 = 70 + 4$$
$$74 = (7 \times 10) + 4$$

sends a valentine to

$$382 \longrightarrow 38$$
$$382 = 380 + 2$$
$$382 = (38 \times 10) + 2$$



“Can you draw some other posters?” asked my friend.

I studied Zero’s new posters carefully and then wrote:

sends a valentine to

65  $\longrightarrow$  6

$65 = 60 + 5$

$65 = (6 \times 10) + 5$

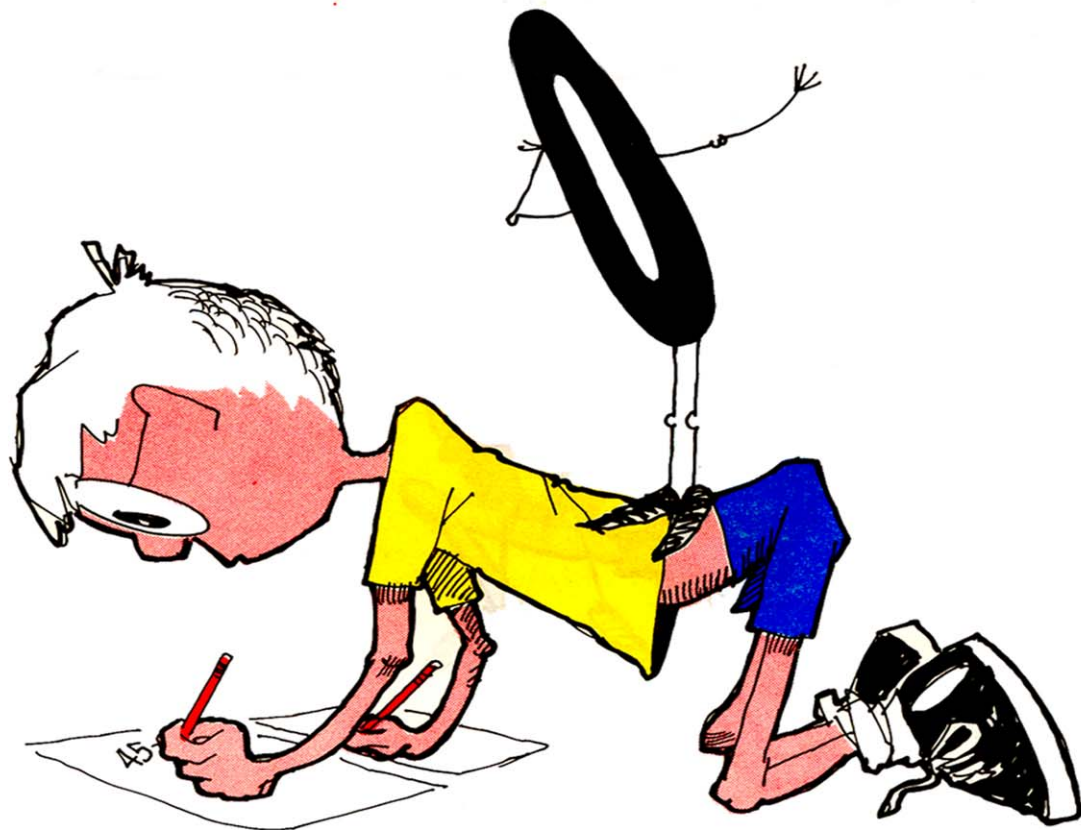
sends a valentine to

879  $\longrightarrow$  87

$879 = 870 + 9$

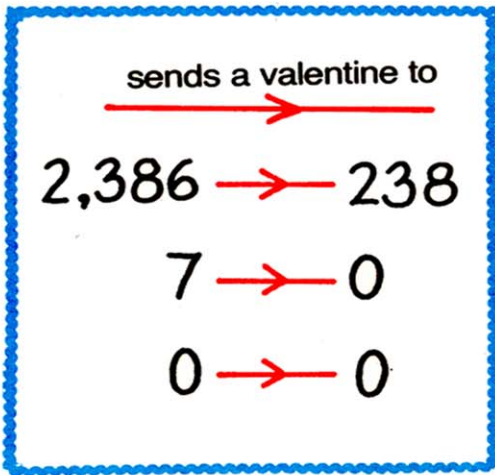
$879 = (87 \times 10) + 9$

“Very well done,” said Zero approvingly.

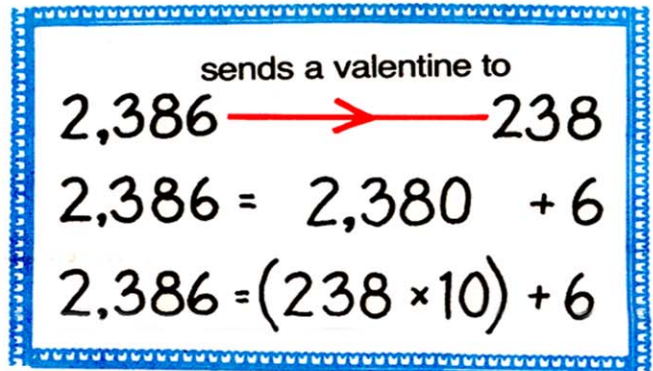


TRY TO DRAW SEVERAL POSTERS OF YOUR OWN.

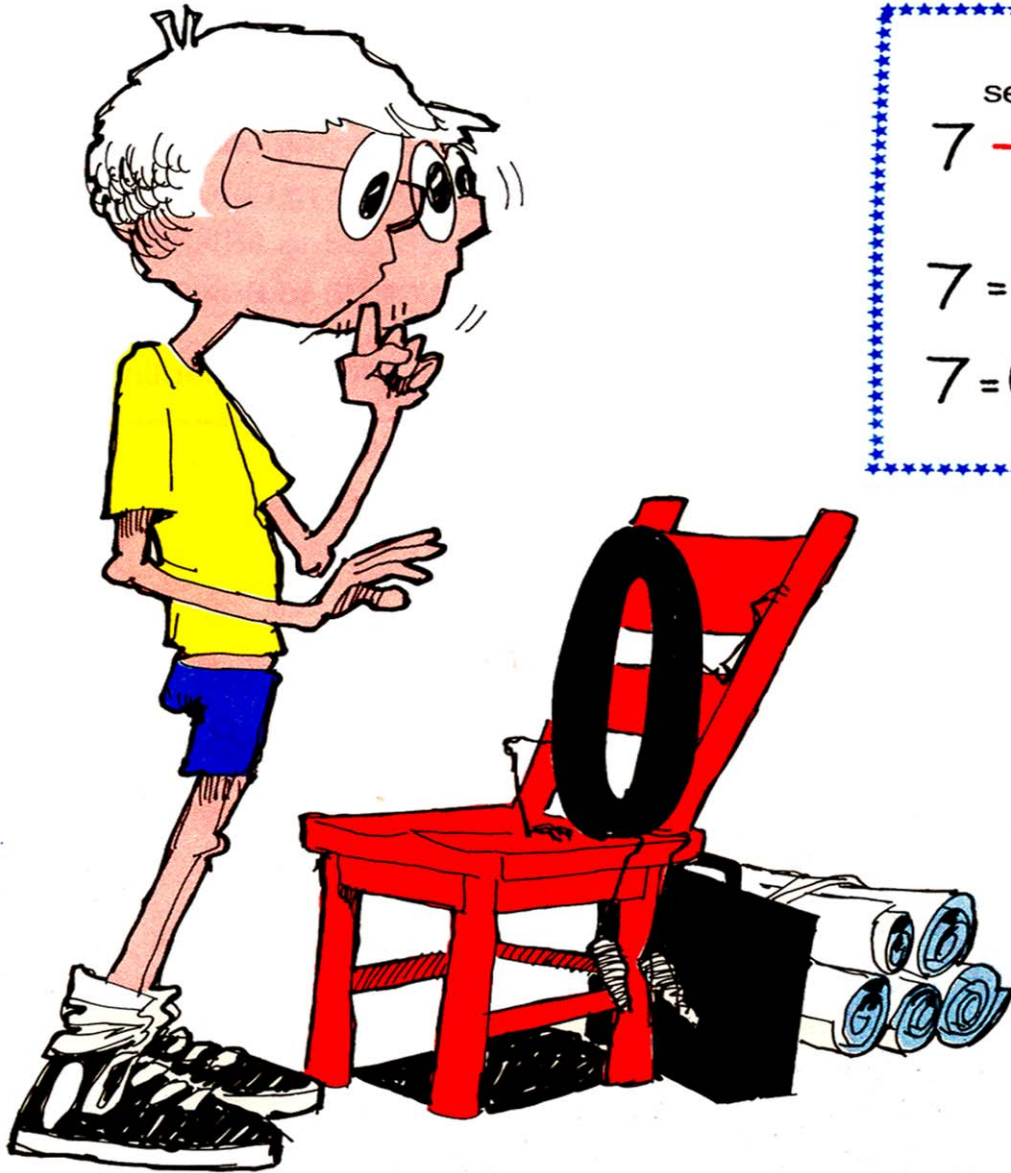
"Can you explain this new poster?" asked my friend.



"I understand why 2,386 sends a valentine to 238. But I don't really see why you receive valentines from 7 and from yourself," I answered.



Zero drew this poster.



sends a valentine to

$$7 \longrightarrow 0$$
$$7 = 0 + 7$$
$$7 = (0 \times 10) + 7$$

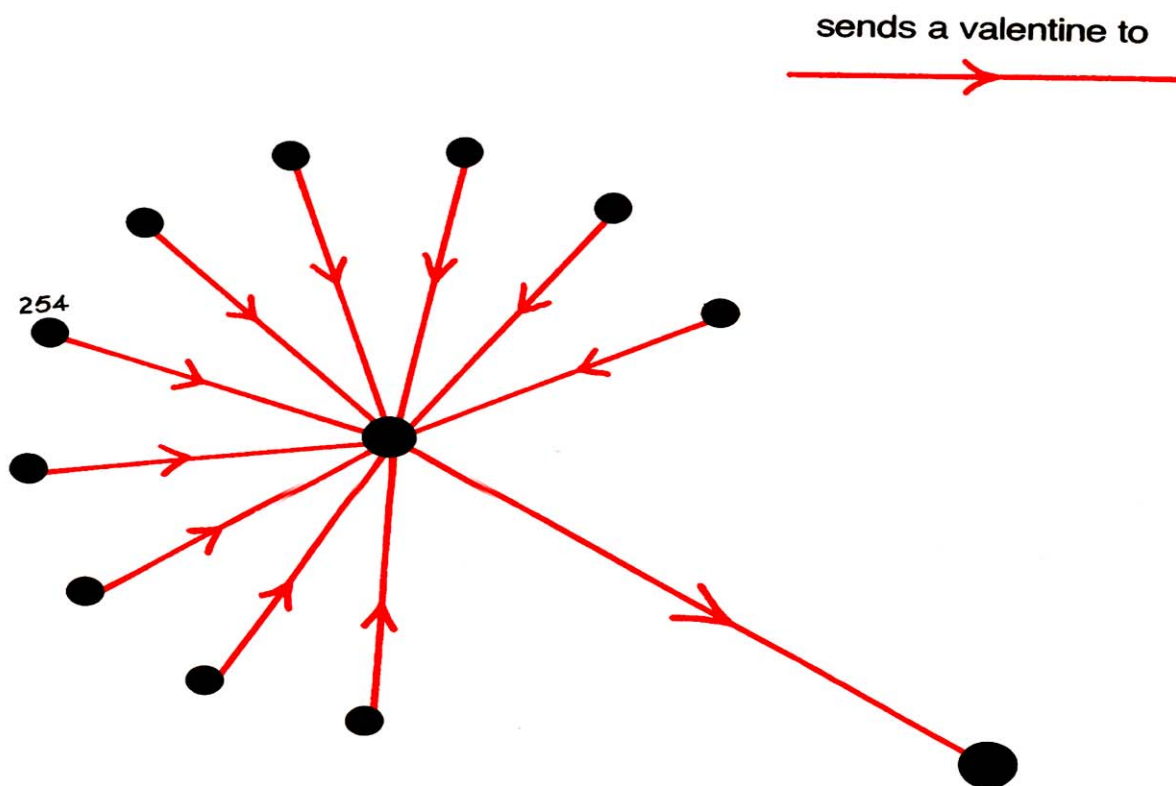
"Now I understand," I said as I drew this poster.

$$0 \longrightarrow 0$$
$$0 = 0 + 0$$
$$0 = (0 \times 10) + 0$$

“Here is a new poster,” announced Zero.

We pasted this flower on one wall of my room.

“Don’t forget what the arrows mean.”



“Can you label the dots?” asked my friend.

“The number 254 sends a valentine to 25,” I said. “Therefore 25 is the center of the flower.”

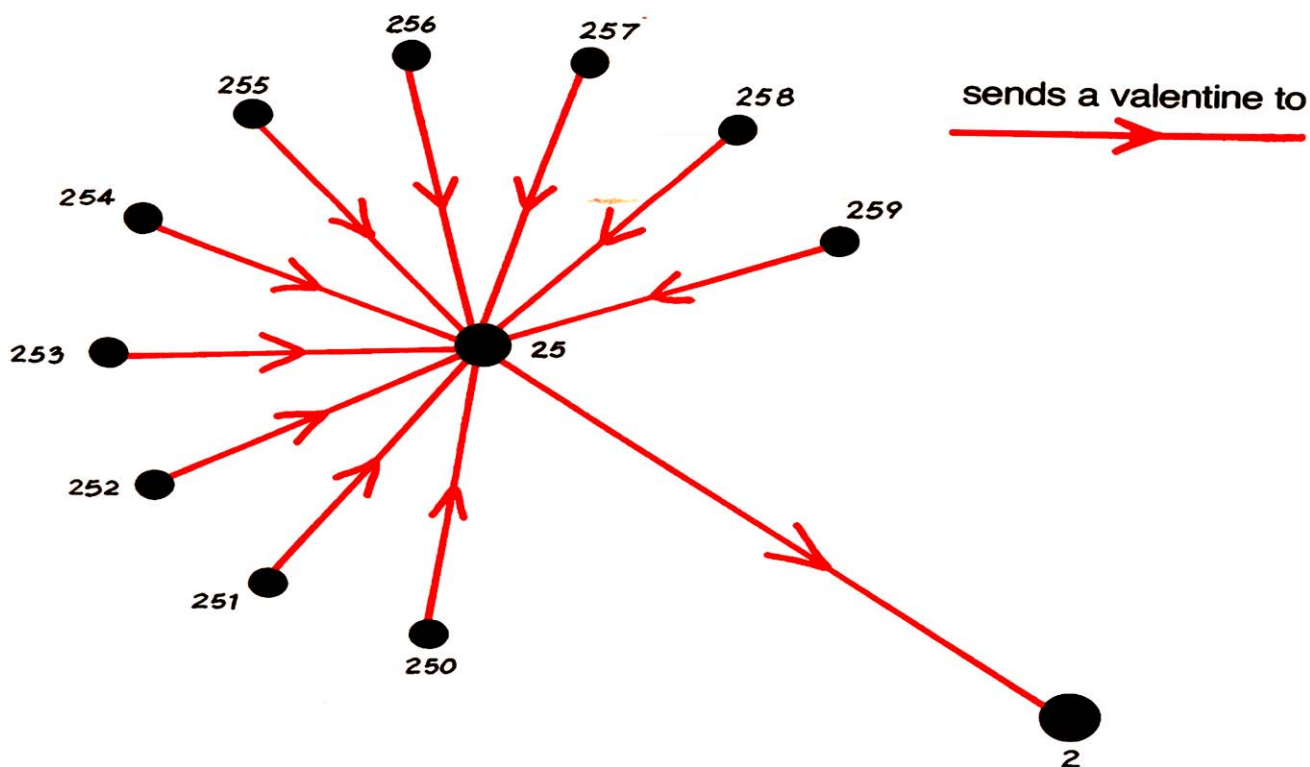
“That’s right,” agreed Zero.

“I understand why 25 received ten letters from 250; 251; 252; 253; 254; 255; 256; 257; 258 and 259. I’m beginning to understand the rule of your game more clearly now.”

“How should we label the last dot at the bottom of the flower?” asked Zero.

“25 sends a valentine to 2,” I answered.

For some minutes, we gazed in silence at this marvelous poster.

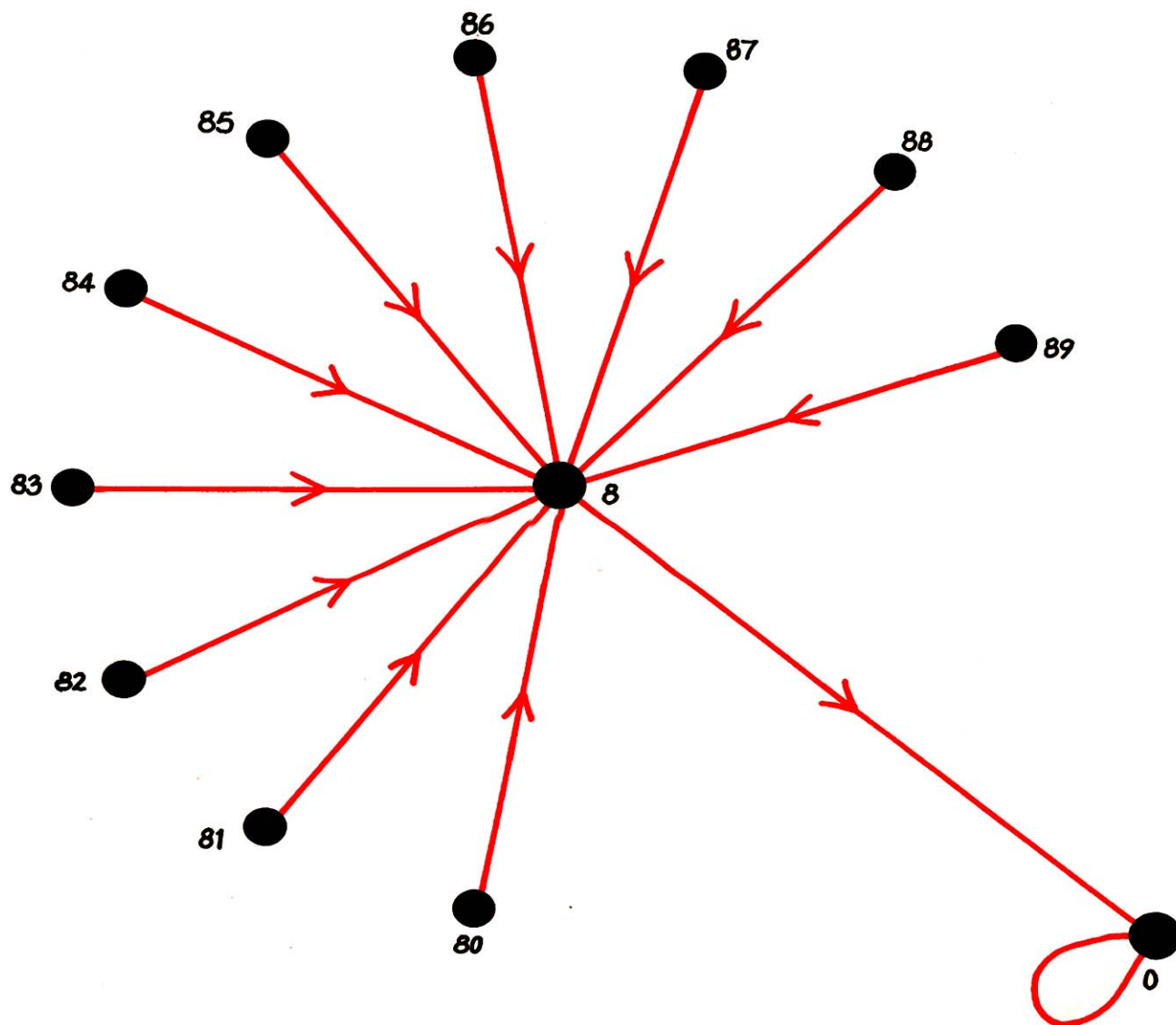


“Draw a new flower with me as a last dot,” suggested my friend.

“That’s not an easy problem to solve,” I thought.

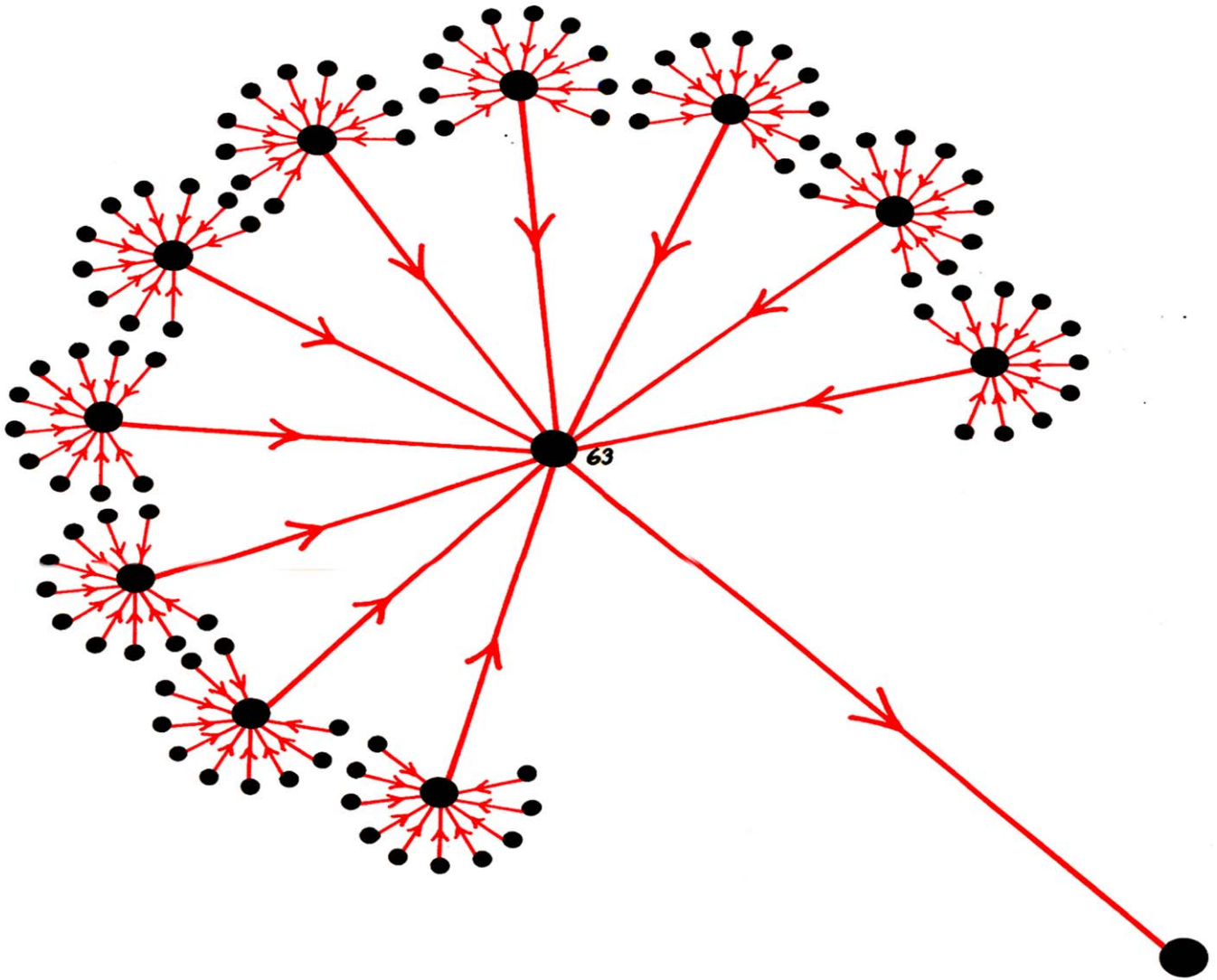
**TRY TO DO IT BEFORE YOU TURN THE PAGE.**

Suddenly, I shouted, "I know how to do it,"  
and I drew this picture.



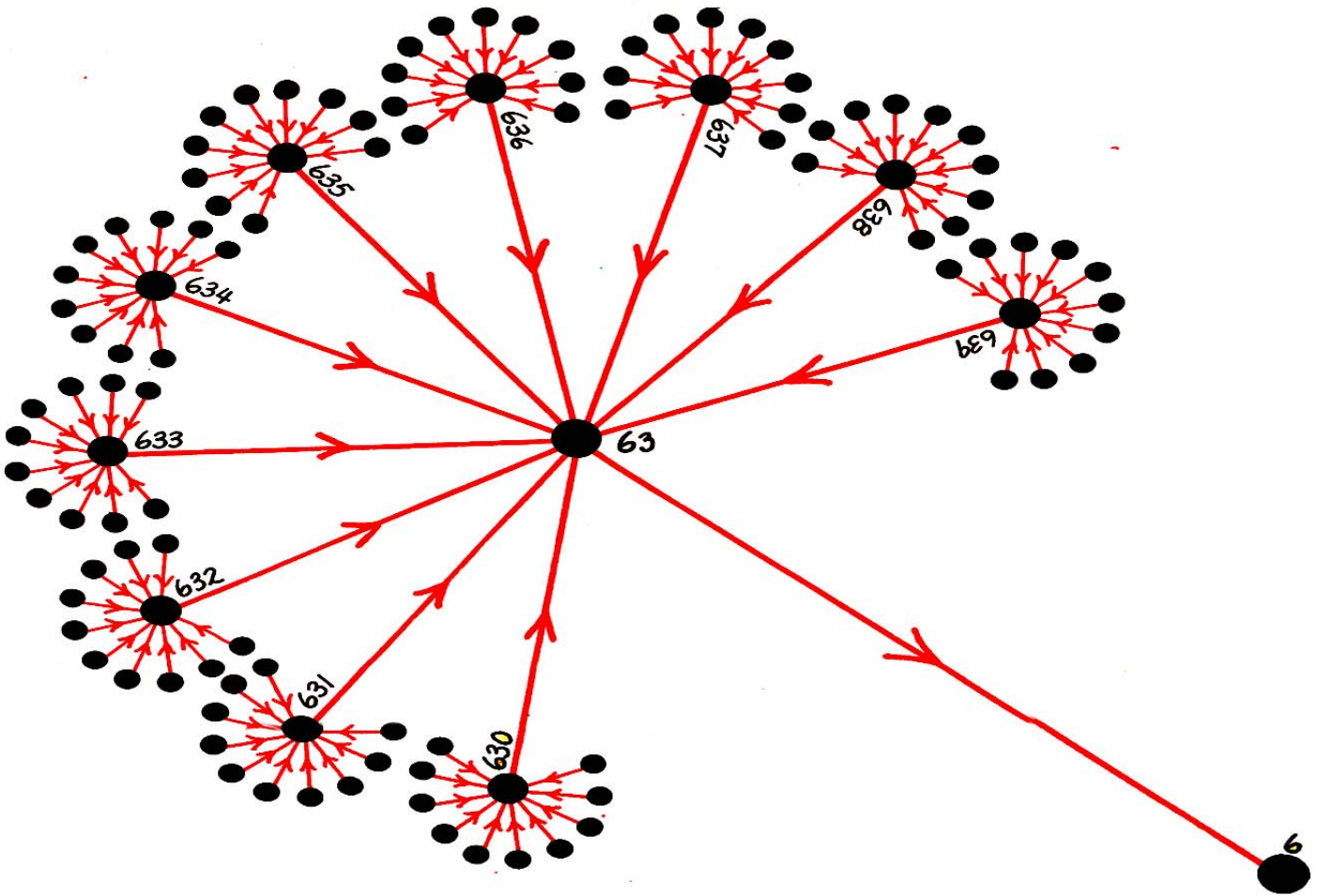
IS MY SOLUTION THE SAME AS YOURS?

“You’re becoming very good at my game,”  
observed Zero, while pasting up a  
new flower.



CAN YOU LABEL THE DOTS? DO SO BEFORE YOU TURN THE  
PAGE.

I drew:

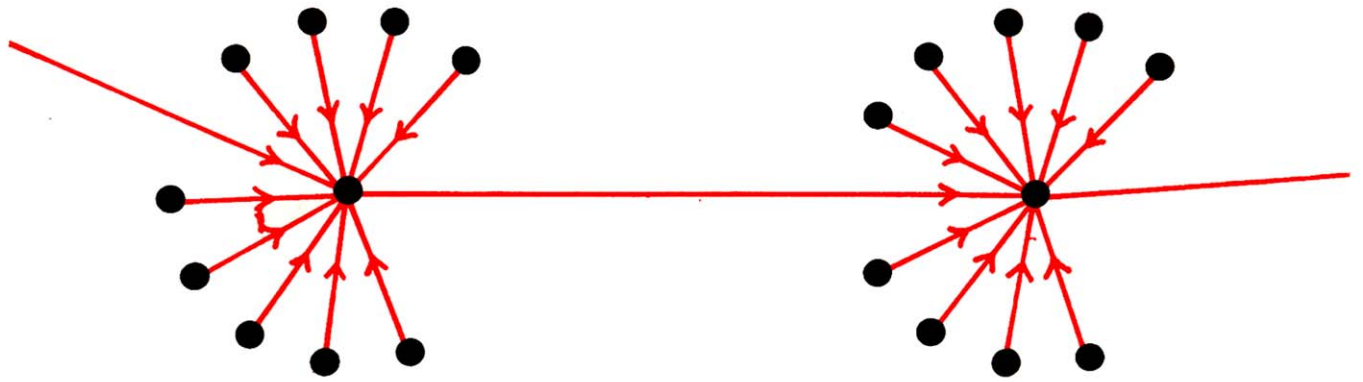


“Very well done,” agreed Zero. “But you didn’t write all of the numbers. There are a lot of dots that are not yet labeled.”

“That’s easy. I can see that 630 receives valentines from 6,300; 6,301; 6,302; 6,303; 6,304; 6,305; 6,306; 6,307; 6,308; and 6,309. And it’s the same sort of thing for the other dots.”



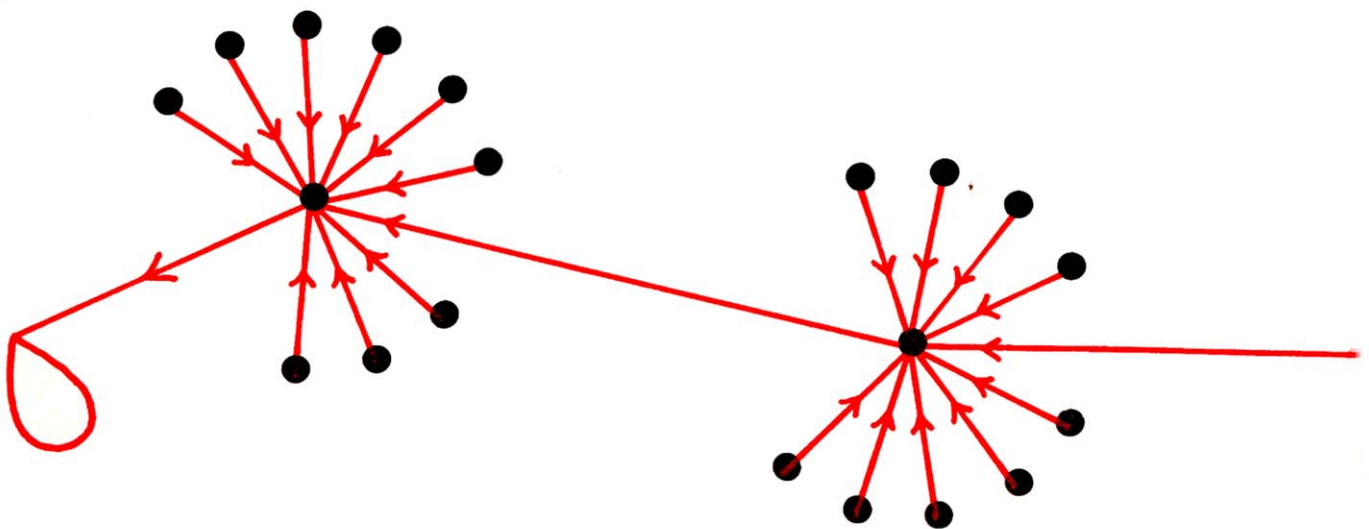


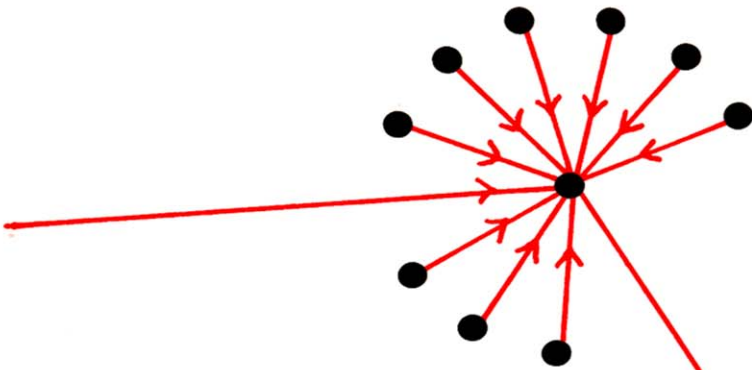


Zero carefully unfolded a very large poster  
and pasted it on a wall of my room.

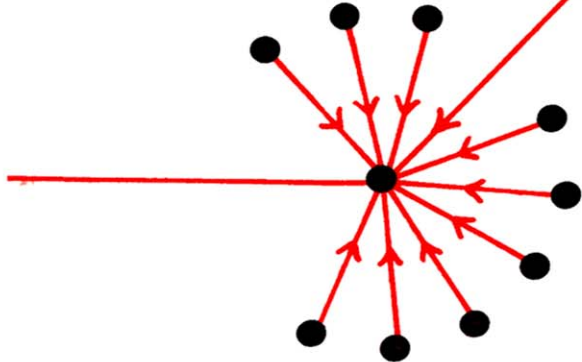
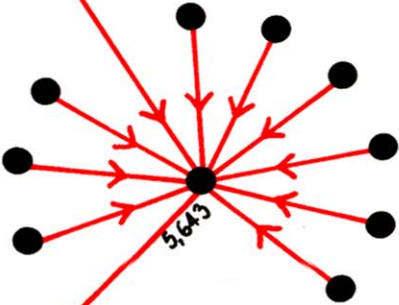
As I looked at this picture, I began to  
feel a little dizzy.

"You're a magician," I said to my friend.





“Can you recognize all of these numbers?”  
asked Zero.



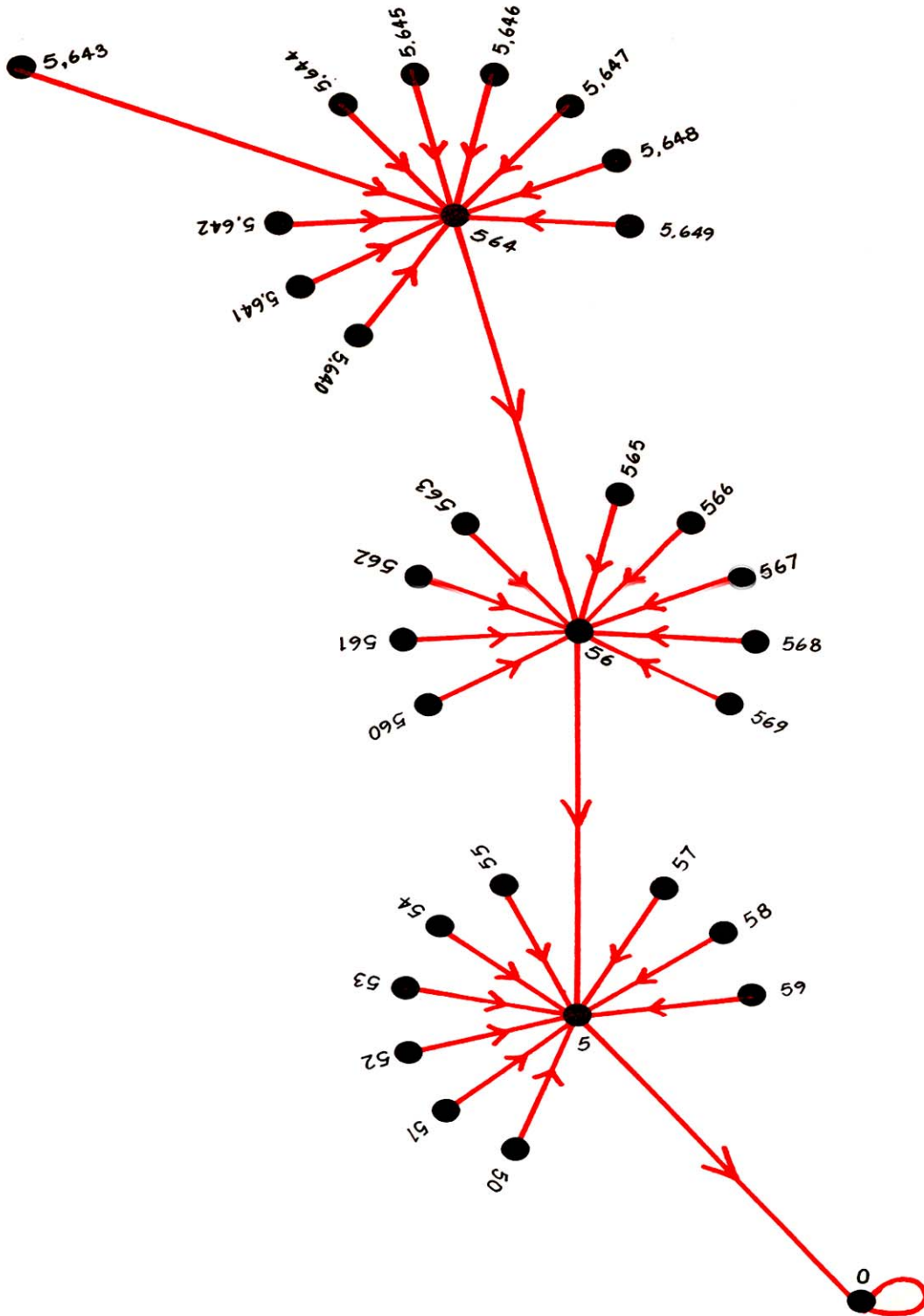
TRY TO SOLVE THIS PROBLEM BEFORE YOU TURN THE PAGE.

I started at 5,643 and thought:



“Okay,” said my friend.

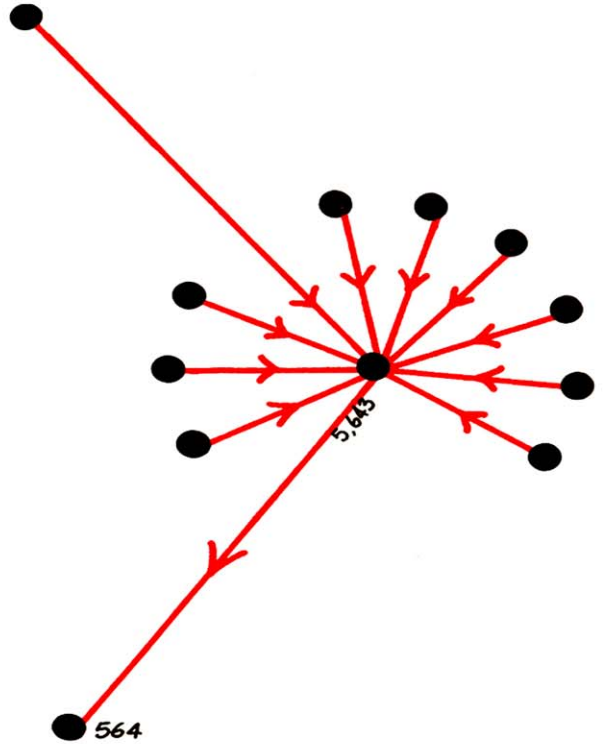
I went on:



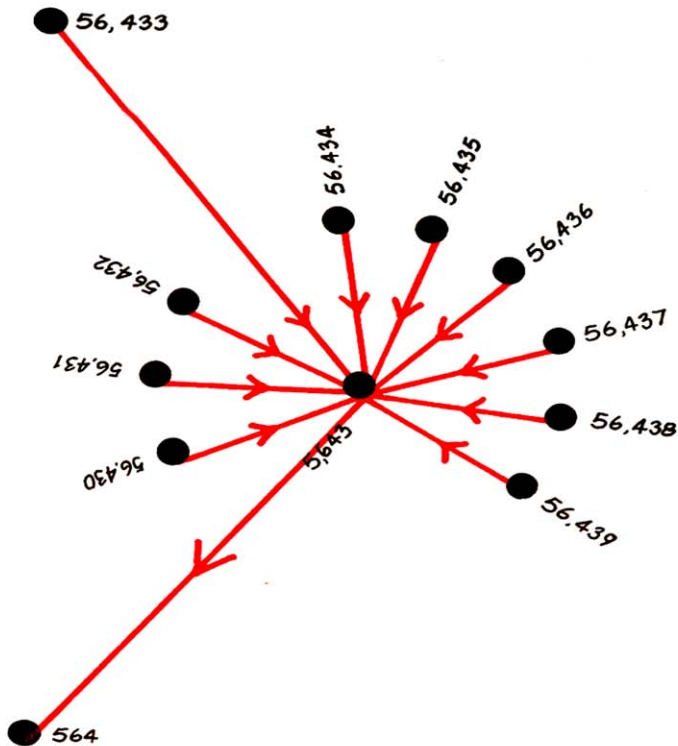
I could not make up my mind about this part of the picture.

"I cannot decide what the number at the top of the flower is," I said. "It could be 56,430 or 56,431 or 56,432 or 56,433 or 56,434 or 56,435 or 56,436 or 56,437 or 56,438 or 56,439."

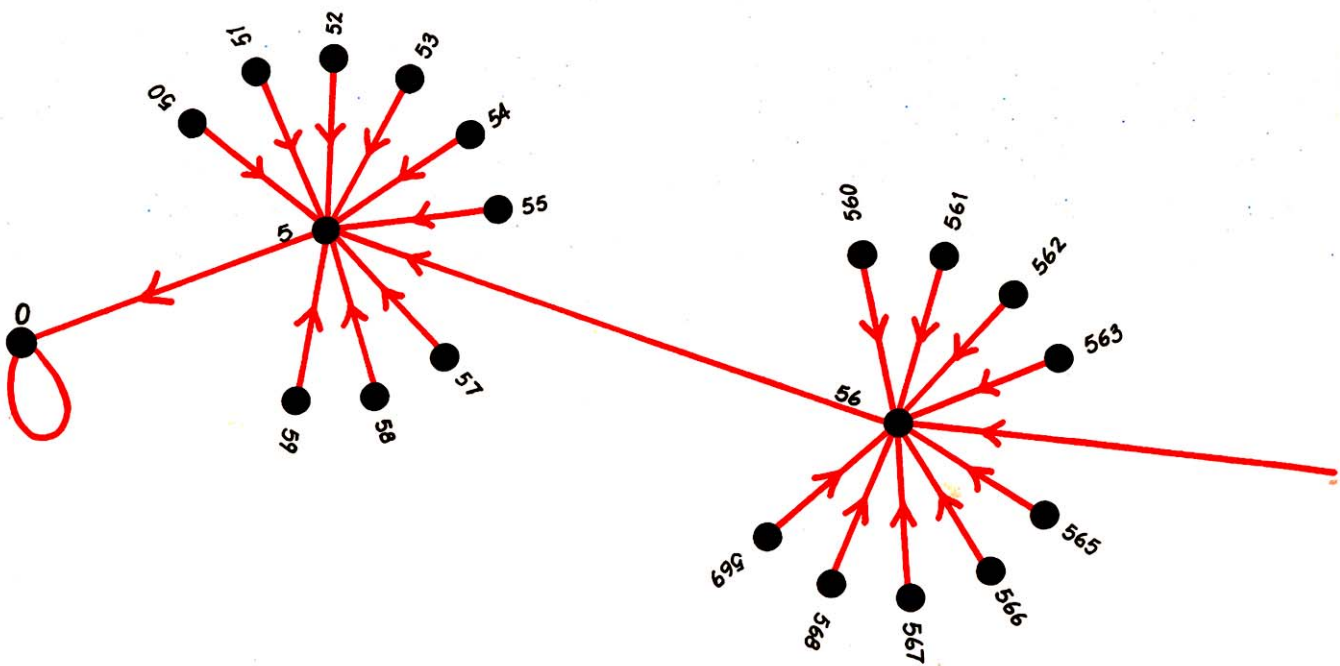
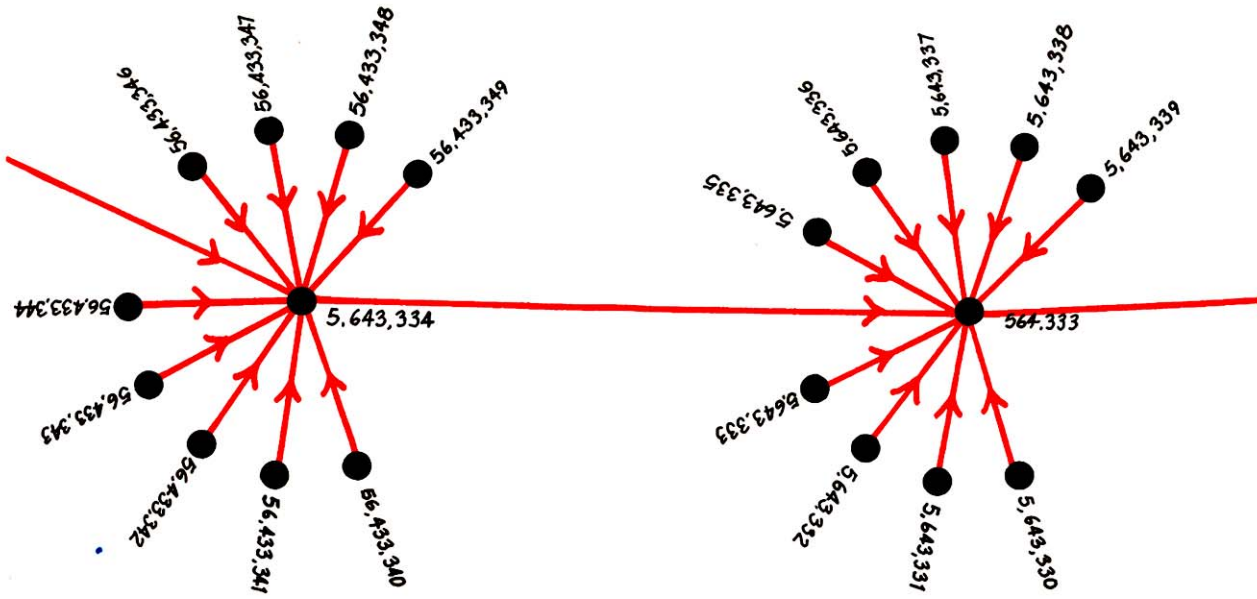
"You are right," agreed Zero. "You have a choice among these ten numbers."

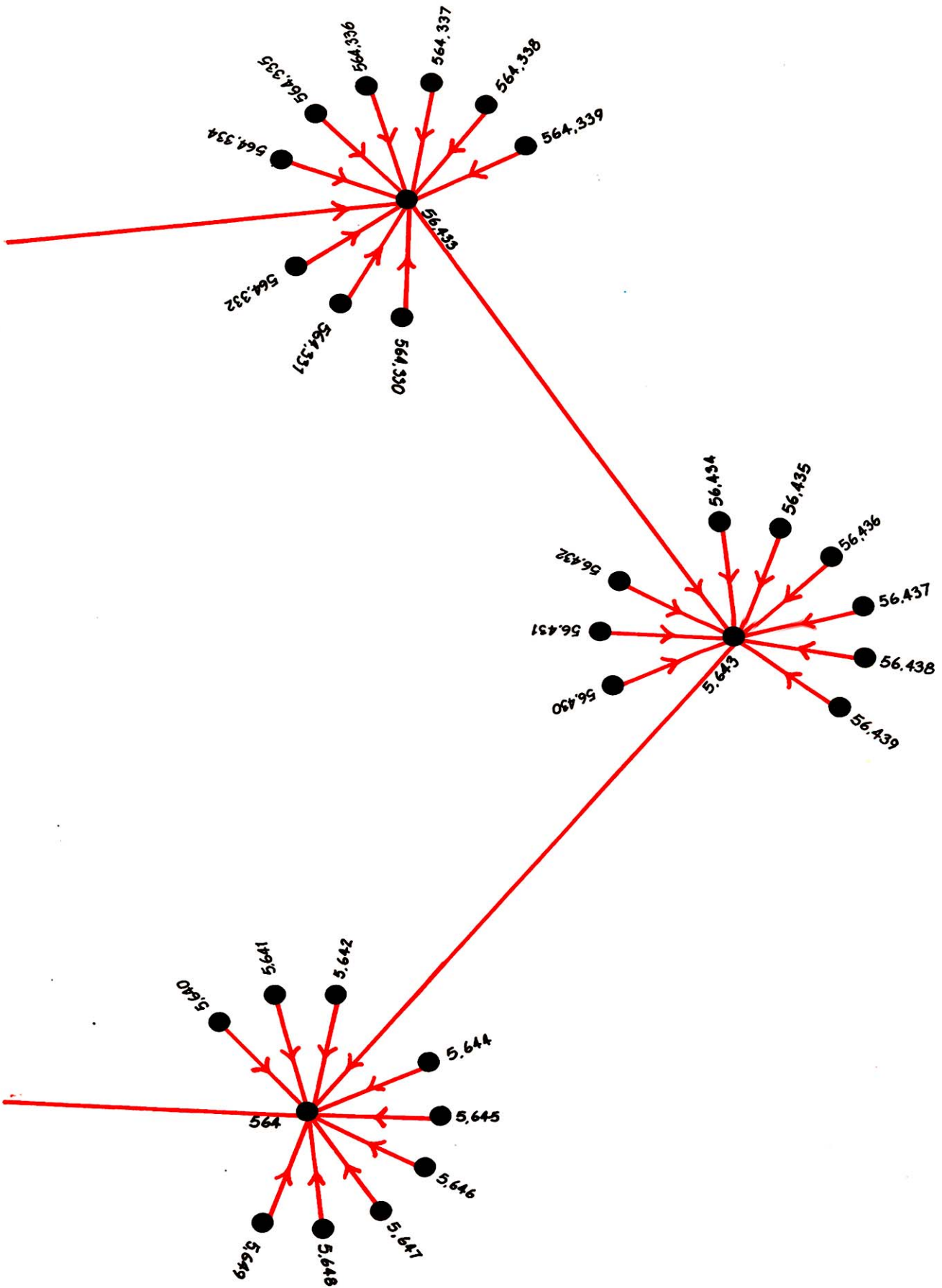


After some hesitation, I wrote:



Reasoning in a similar way, I completed the picture.





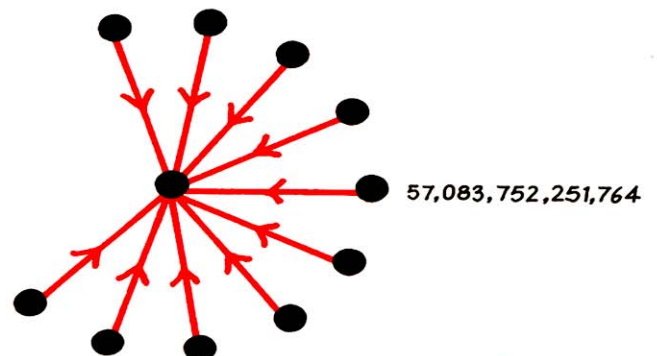
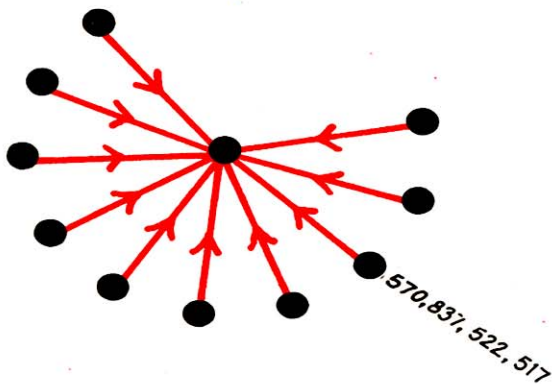
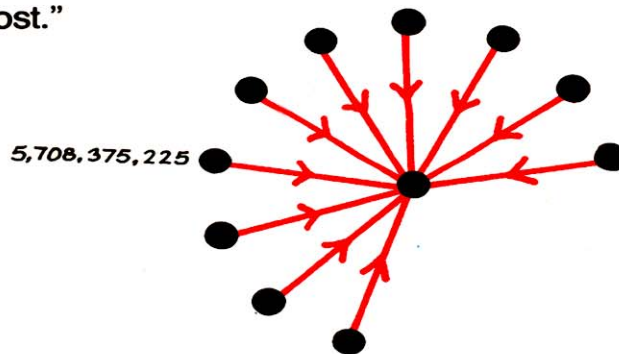
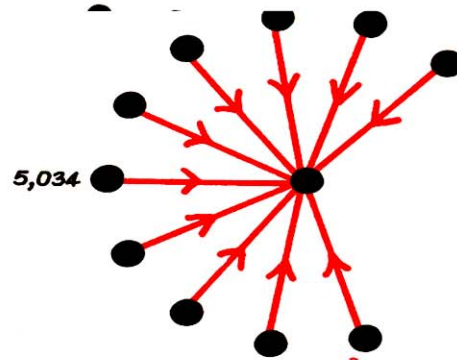
"I am working on a pattern for new wall-paper in my bedroom," said my friend.

Zero unfolded a large piece of paper.

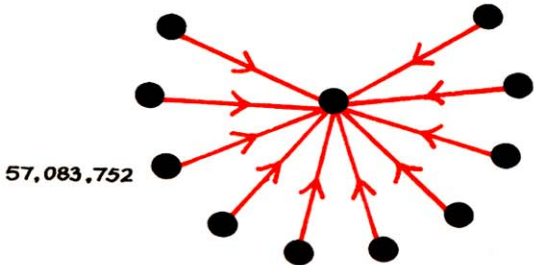
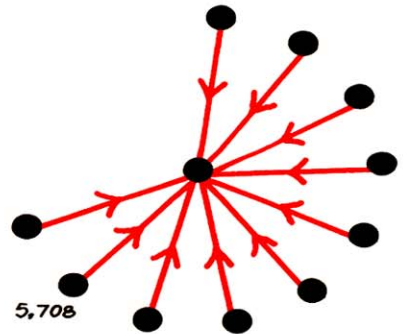
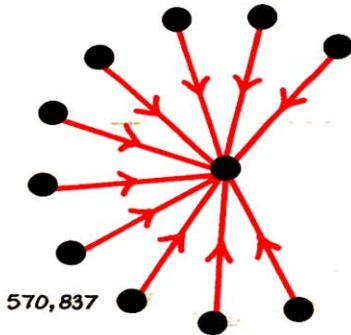
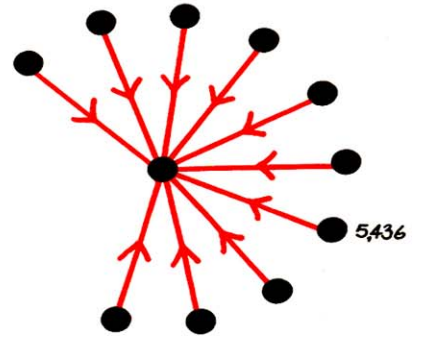
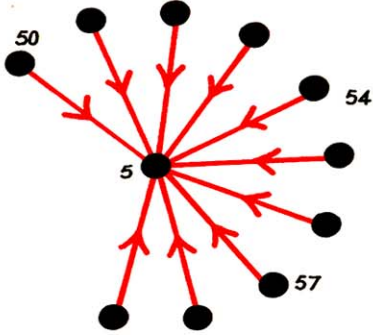
"What a marvelous set of flowers," I ex-claimed.

"My picture is not finished yet. The connections between the flowers are still missing. Can you help me to fill them in?"

"That's not going to be easy to do," I thought. "There are so many dots and so many arrows. I am a little lost."

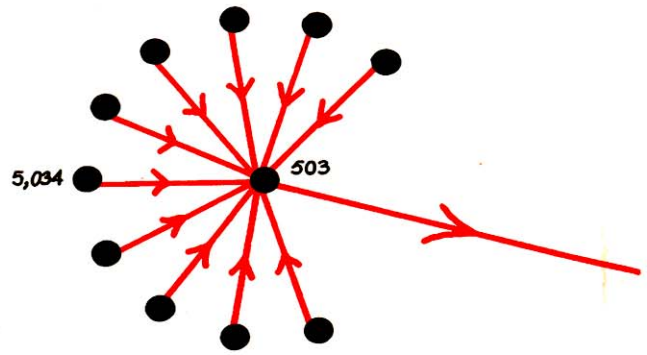




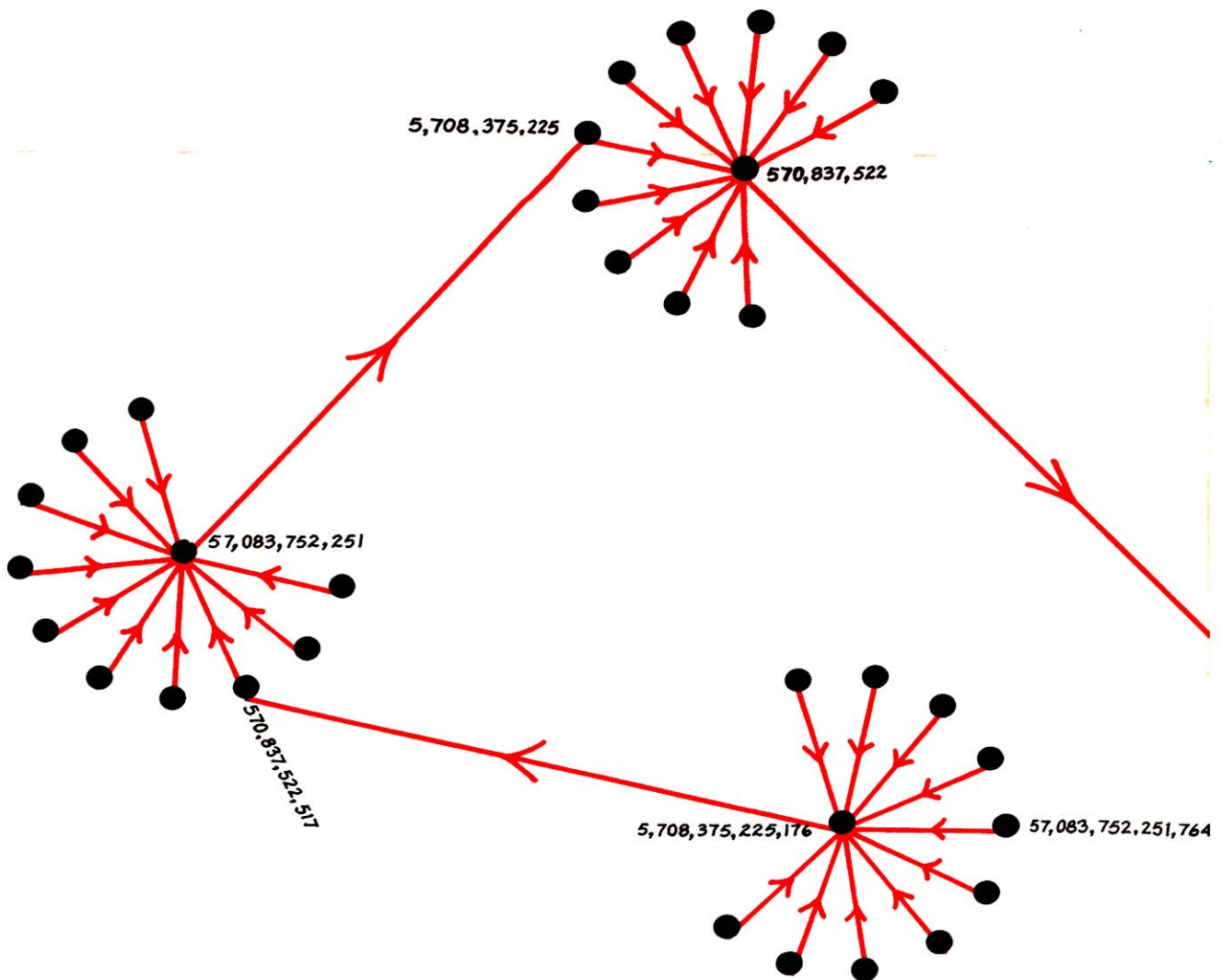


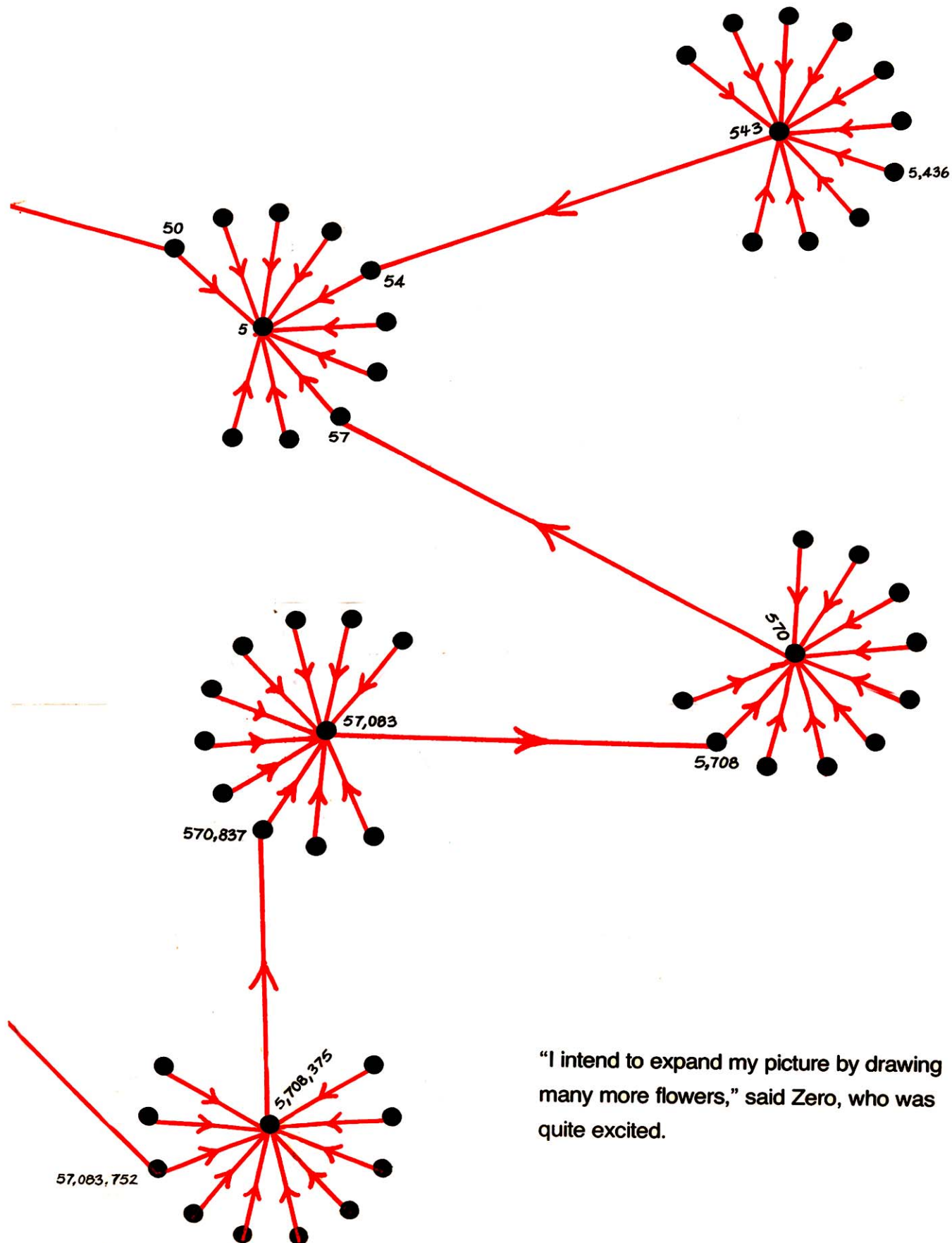
DON'T HURRY!

DON'T TURN THE PAGE UNTIL  
YOU HAVE DRAWN ALL OF THE  
MISSING ARROWS.



In the course of a lively discussion, we solved the problem step by step.



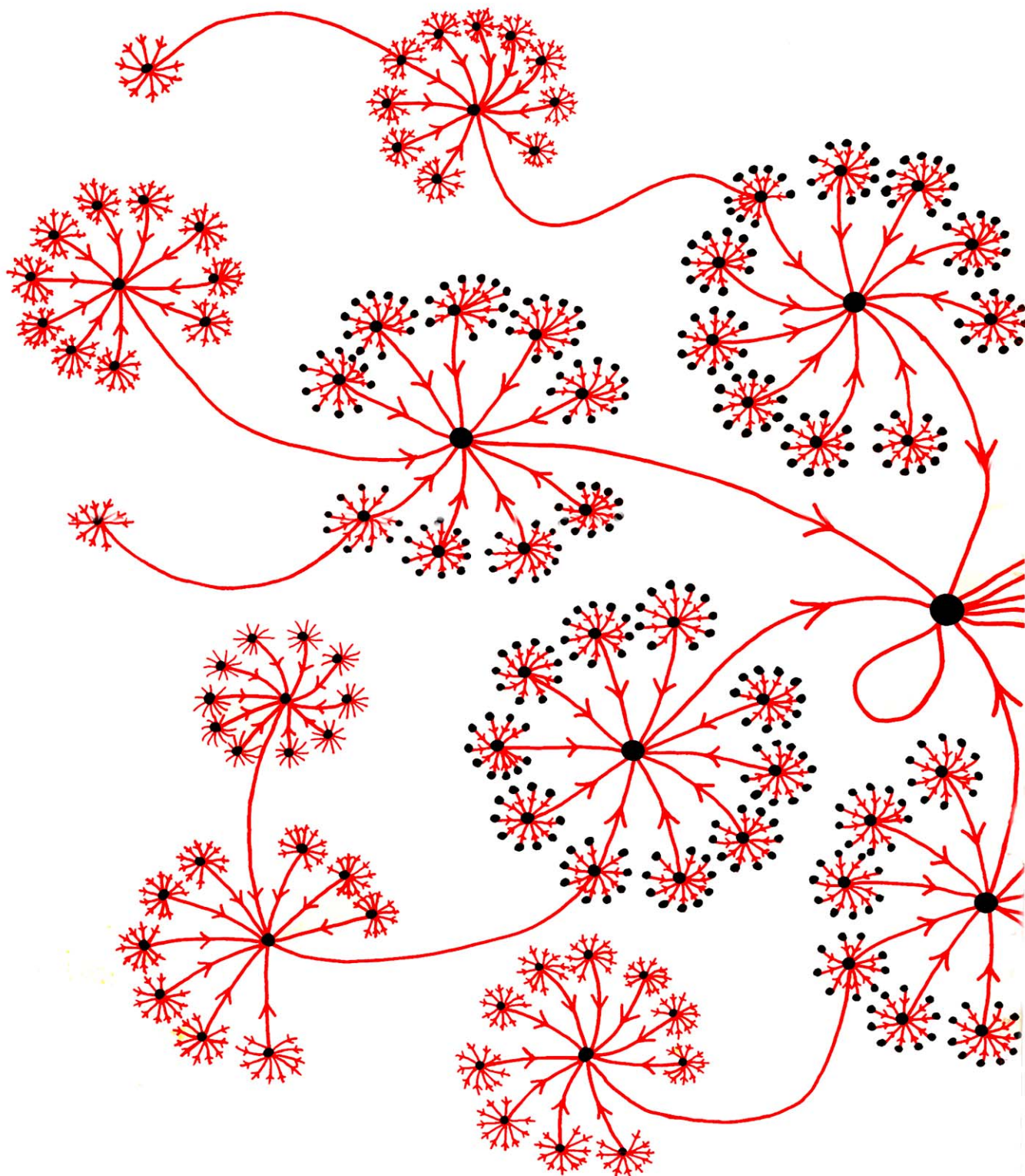


"I intend to expand my picture by drawing many more flowers," said Zero, who was quite excited.

"I am working on another project," announced my friend, while spreading this new poster out on the floor.

"It is a fantastic tree," I shouted.

"And I am the center of the tree," said Zero proudly.



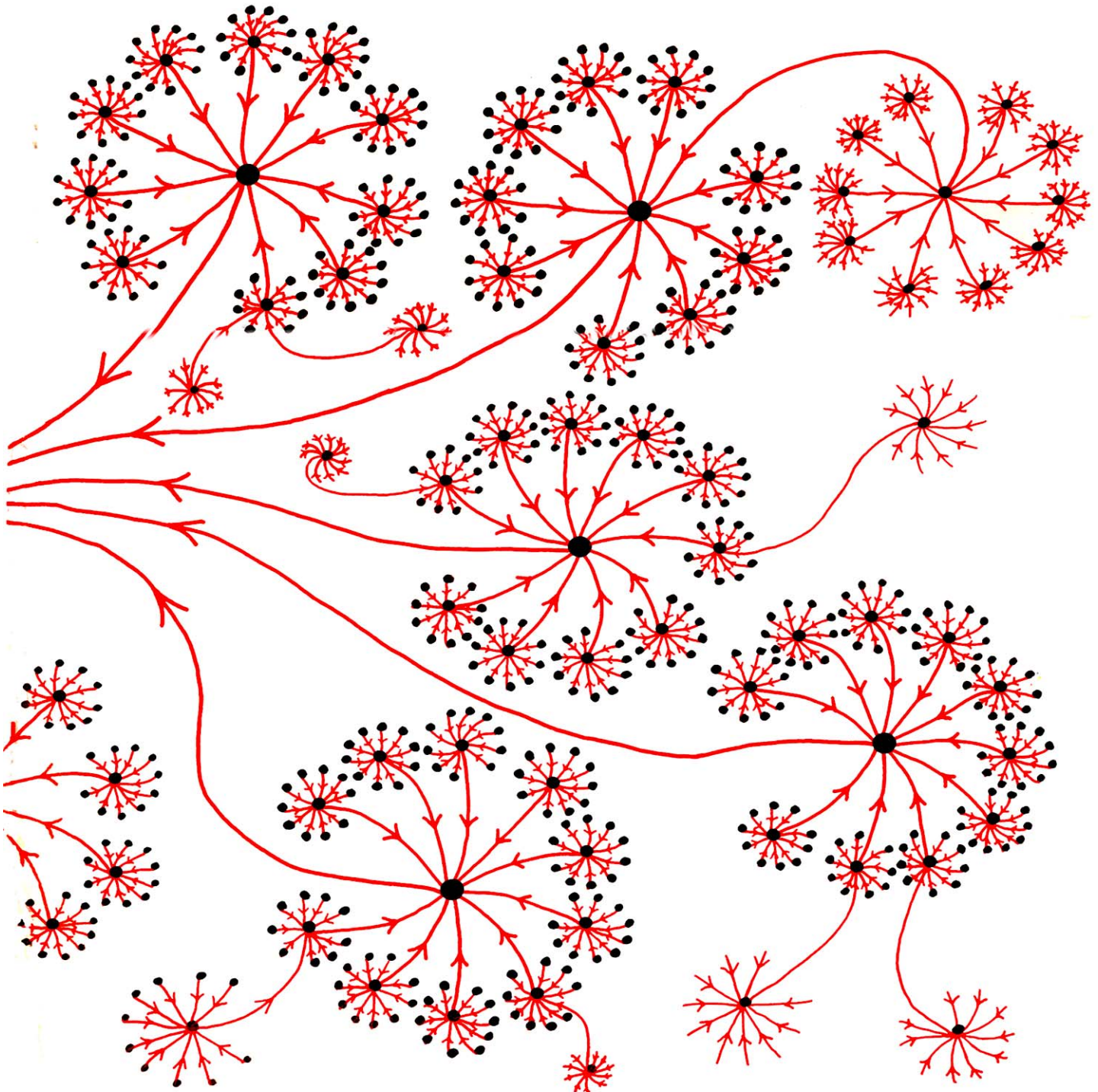
“You have many more dots and many more branches to draw,” I observed.

Zero looked at me with a smile.

“You poor human being! Do you still believe that I could ever finish drawing this picture?”

I was confused.

WHAT DO YOU THINK ABOUT WHAT ZERO SAID?



"I receive a valentine from myself, but I also receive valentines from nine other numbers," said Zero.

"Look carefully at the tree and listen to this song."



receives valentines from 0 and from

1; 2; 3; . . . 7; 8; 9

who receive valentines from

10; 11; 12; . . . 97; 98; 99

who receive valentines from

100; 101; 102; . . . 997; 998; 999

who receive valentines from

1,000; 1,001; 1,002; . . . 9,997; 9,998; 9,999

who receive valentines from

10,000; 10,001; 10,002; . . . 99,997; 99,998; 99,999

who receive valentines from . . .

And so on, forever and ever and ever.

“Your game is fantastic,” I concluded.  
“Now I can see why I cannot play it with  
the children at school.”

“Paste this picture up on a wall of your  
classroom,” said Zero. “It will remind  
you of the power of your friends, the  
whole numbers.”

Before leaving Zero added, “I have some  
new ideas for next Valentine’s Day. But I  
won’t say anything more for the moment.”



CAN YOU THINK OF YOUR OWN VALENTINE GAME FOR THE  
WORLD OF NUMBERS?



Stories by Frédérique  
Ages 5 to 8

The Playful Numbers  
81 Roses  
I Am a Very Happy Boy  
One Out of Seven  
The Happy Puppet  
The Old Shoemaker  
Two By Two  
The Little Dreamer  
Where's My Nose?  
The Magic Box  
The Baby Is Born  
The Weird Story of 24  
Summer School in the Old Days

Ages 8 to 12

The Little Donkey  
Singing Friends  
Dancing Friends  
The Living Lines  
I Am Not My Name  
Nabu Wins an Award  
The Square Trap

Ages 10 to 14

The Hidden Treasure  
A Very Strange Neighborhood  
Election in the Number World  
A Valentine Mystery

If each person is to receive ten Valentine cards and no person is to send more than one card, then you need at least ten times as many senders as receivers. That's obvious! Or is it? That's the subject of "A Valentine Mystery."

When Zero announces that this year in the World of Numbers they will celebrate Valentine's Day in a way in which the hero of the story will not be able to duplicate with his friends, the news is greeted with frank disbelief. However, as the story progresses, as Zero gradually unfolds the grandiose scheme behind the numbers' celebration, a suspicion begins to grow that perhaps Zero's claim is not so farfetched after all — perhaps there's something about the set of whole numbers that allows things to occur that could never happen to mere mortals.

Thus Zero's magnificent, explanatory posters, accompanied by patient questioning, afford the reader a revealing glimpse into the strange things that can occur in the realm of the infinite.

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