

A REFLECTION ON PROBLEM SOLVING

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Abstract

In this paper, I studied on the problem solving process of a question. I represented its stages according to Polya's problem solving approach which includes the main parts of *understand the problem, make a plan, work the plan, and look back and check*. For the given problem, I also considered on a *what if...* situation and explained my ideas/strategies as a second part.

Key Words: Polya's problem solving stages, constructing strategies, *what if* situations.

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Introduction

The purpose of this article was to represent a problem and its solution process which is stated below. Here, I conducted my approach according to Polya's problem solving stages. I summarized my findings for this problem, and then I looked for what if the axes were reversed. At the end, I stated my justifications.

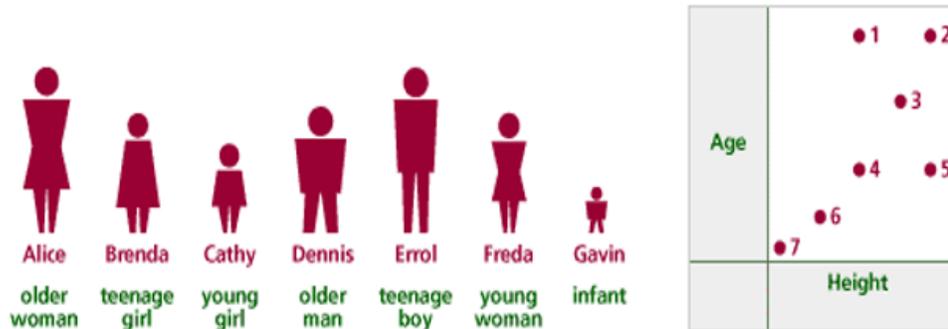


Figure 1. The main body of the problem.

Make Your Decision: Whose Place Is It?

Stages of the Problem Solving

The problem asks for matching the people for the numbers on the coordinate system. Here is the main body of the problem: *Look at the graph. Who is represented by each point?* The first thing is *understand the problem*. The x-axes represent the height, so I must utilize from the figure. The y-axes represent the age, so I must utilize the expressions below the each person.

The second thing to do is *make a plan*. I looked for a starting point first by using both expressions and figures of the people. Then I thought I could find out the other ones in tandem. I chose Gavin whose both age and height are the smallest among the group members. So, I decided on my starting point: #7 is Gavin.

The next step is *work the plan*. After than deciding a starting point, who will be the following? I went on with the same approach. After Gavin, the second youngest group member

is Cathy whose height is also the second if it is ranked from short to long. So, #6 will be Cathy on the coordinate system.

Then it is seen on the coordinate system that #4 and #5 are almost in the same age since if it is considered from the y-axis (which represent the ages), it will be seen the y-value of these numbers are very close to each other. Therefore it must be decided on the numbers by looking for the heights. When I looked at the figure again, there are two teenagers whose ages are very close to each other. Here, it could be considered that there are two older people whose ages may be very close to each other, too. However it would be more coherent when we thought that Gavin was an infant, and Cathy was a young girl respectively. So I decided on #4 as Brenda who is a teenage girl and her height is longer than Cathy; shorter than Errol, the teenage boy in the group. As a consequence, #5 will be Errol.

As I mentioned above, there is one more group of two whose ages are very close to each other. They are Alice (older woman) and Dennis (older man). It is seen two highest y-values in the coordinate system. Since Alice and Dennis are the two oldest of the group, they will be on the top. But which number will represent Alice and for which one we can say it is Dennis? To understand this, I compared their heights. Alice was longer than Dennis. So, I decided on #2 as Alice and #1 as Dennis. There was one group member left, so I decided on #3 as Freda.

The last step is *look back and check*. Here I checked my matching by asking to myself whether it could be yet another option. As a result of my checking, there are no other options for #7 and #6. Since Gavin and Cathy are the first two youngest and shortest of the group. However it could be considered on #1 and #4 by looking from the x-axis. These two people's heights are very close to each other. It could be seen from the x-values of them. Here the decision point is their ages, then. Since the age of #4 is smaller than #1's, it is right to say #4 is Brenda and #1 is Dennis. Likewise it could be thought in the same way for #2 and #5 who are Alice and Errol,

respectively. And lastly for #3, I checked if Freda is really longer than Brenda and Dennis, while she is shorter than Errol and Alice. Additionally I checked if Brenda is older than Brenda and Errol, while she is younger than Alice and Dennis.

What If the Axes Were Reversed?

The question of *what if the axes were reversed* conduct me to consider on the numbers remaining the same even the position of the height and age were changed. From this point of view Gavin and Cathy hold their place as the same for the first one. However since I imagine the x-axes divided into parts such as infant, child, teenage, youngsters, and adults, I need to change the positions of #4 and #5 as thinking them vertically this time. Similarly, it would be appropriate for #1 and #2. Lastly again for Freda, she would keep her place as very similar to the first one. Here is the image of the new condition:



Figure 2. The axes were reversed.

Conclusion

The purpose of this article was to represent a problem's solution stages by considering on Polya's problem solving approach. By the way, I represented my strategies while trying to solve

the problem and justify it. I thought this process as if I was a teacher in a class with middle school graders and usually I admonished to myself about being clear as possible as.

"A Bilkent student does not lie, cheat, or steal or tolerate those who do. On my honor, as a Bilkent student, I have neither given nor received unauthorized aid on this academic work."

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