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How to Solve Algebra Problem Using Thinking Geometry?

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Abstract. This study aims to determine how to solve problems algebra using thinking geometric settlement. Answer students explore the interview to find out the thinking of students in resolving problems. The research subject X1 grade students high school. The study was conducted over four weeks. In solving the problems done think a loud and interviews conducted four times. After the interviews, the results obtained ajar problem can be solved geometrically by the help of pictures, by describing a curve and then proceed with the analysis.

1. Introduction

Studies of thinking geometry has been studied by experts [1-3]. Hollerands [4] reveals there are three important reasons to learn geometry, which gives an opportunity to the students to think about the important concepts in mathematics, provide a context in which students can see mathematics as a discipline are interconnected and provide the opportunity for students to engage in high-level reasoning activities using a variety of representations. Similarly, Guven [5] found in geometry mempelejadi need a lot of exercise and the use of a means of involving students in solving problems. Van de Walle [6] also revealed the importance of studying the geometry, the geometry is closely related to our daily lives we, the geometry can develop problem solving skills, geometry plays an important role in studying the branches of other mathematical, geometry can be used in everyday life and studying geometry very pleasant. Clements and Battista [7] suggests that students' geometric thinking developed through the use of measurement and transformation of an object. Dindyal [8] says that the students' thinking in geometry also requires a facility with algebra. According algebra has a strong relationship with geometry. Panaora da Gagatsis says that educators need to understand how students construct geometrical knowledge. It seems that connects between geometry and algebra was not easy [9-11]. NCTM [12] says that the ability of the geometry must be owned by the students are: (a) analyze the characteristics and properties of geometric two-dimensional and three-dimensional and develop mathematical arguments about geometric relationships; (B) determine the position and describe spatial relationships using coordinate geometry and other representational systems; (c) to apply transformations and use symmetry to analyze mathematical situations; and (d) use visualization, spatial reasoning, and geometric modeling to solve problems.

2. Research methods

2.1 Time and Research Subjects

The study was conducted on January 2, 2017 to 22 January 2017 with research subjects are students of class XI high school. Subjects were asked to answer the question by using a loud think. The use of this method aimed to obtain a picture of how the subject in solving algebra. The following questions were used to megetahui answered students' skills in algebra by using geometrical way of thinking.

Determine the value of c for the system following equation:

$$\begin{cases} y = 2x + c \\ 16x^2 - 9y^2 = 144 \end{cases}$$

Having, a) 0 solution, b) 1 solution, c) 2 solution.

3. Results and discussion

Here are some excerpts of interviews with student researchers along with an explanation.

P: after reading about it, first of all what you think?

S: This straight line (pointing to the equation $y = 2x + c$) and this parabola (pointing to $16x^2 - 9y^2 = 144$)

P: is it parabola?

S: mmmm, not, hyperbole (smile)

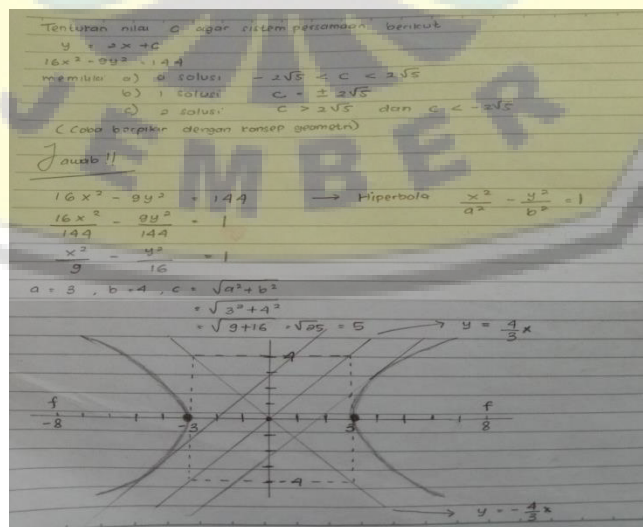


Figure 1. Students Work in Answering

From this conversation means that the student determines what is known of the matter. It is expected students will understand, what is being asked on this matter. Students also understand that the intended has a 0 solution if the two equations are not offensive, particularly a 1 solution if broached at one point and if it has two solutions if both equations point cut in the world. Students also said that had never worked on such matters presented. Students said that never met or worked on the system equations in the form of two lines.

In this work the students explained that will find a value c . the value of c would get of hyperbolic tangent. This line will be removable so getting the right value c offend in one point hyperbole, not offensive and cut at two points. Search c values described in the following student's work.

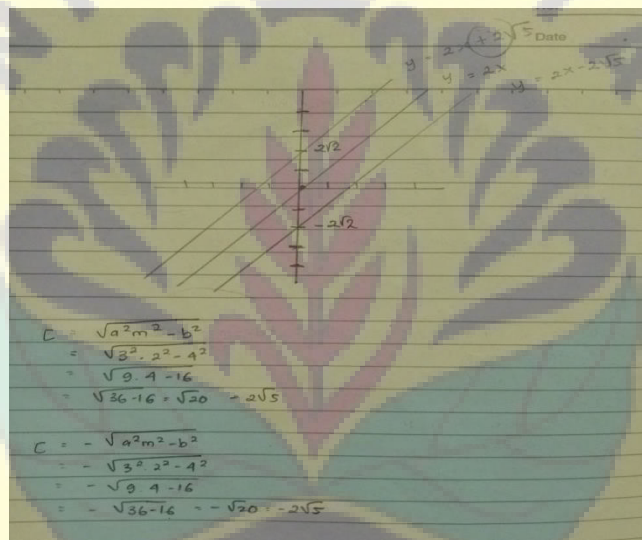


Figure 2. The Student's Work in Finding the Value of c

The work of students using the concept of parallel lines to obtain a value of c requested. So can the conclusion, that the system of equations has a solution if $-2\sqrt{5} < c < 2\sqrt{5}$, has one solution if $c = \pm 2\sqrt{5}$ and has two solutions if $c < -2\sqrt{5}$ or $c > 2\sqrt{5}$

4. Conclusions

In resolving the problem of algebra, students can solve by thinking geometry. The geometry thinking using information available to describe the required curve. Then the dish represents the answer by using a curve. Furthermore, students use strategies to solve problems. In this case students used a tangent by sliding. Finally, after describing a curve a student analyze how to write the condition that the offensive line and hyperbole, intersect at two points or no cut.

Acknowledgments

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