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THE ERROR ANALYSIS OF JUNIOR HIGH SCHOOL STUDENTS IN RESOLVING FLAT STRUCTURE WIDTH QUESTIONS OF BILAH KERIS SENGKELET

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Abstract. Each culture has its own characteristics, like Yogyakarta. It becomes student city, besides, Yogyakarta is one of culture city with its various culture as the main characteristic. One of the culture's arts which is still alive and survive is keris. Keris is believed as the original product of Indonesian culture which has so many types, like Sengkelet. One of philosophy in mathematics educational world is etnomatematika, means mathematics activities at certain culture. In bilah keris sengkelet, there are several shapes of flat structure that we can count its wide. Thus, the research is aimed to know various error of junior high school student's and its factor in resolving flat structure width questions of bilah keris sengkelet. The researcher wants to know the errors which is related to the concepts and principles in resolving the questions about flat structure width. The research method used is qualitative descriptive. The research subjects is chose based on student's mistakes in resolving diagnostic test of similarities which is given to the students. The qualitative data collecting technique is through documentary and interview. Data analysis is done in qualitatively. The result of the analysis shows that student's errors are; wrong in interpreting the question's information, fail in understanding the concepts and principles in resolving flat structure width questions of bilah keris sengkelet, and technical errors. Student's errors in finishing the questions about the width of flat structure questions related to the weaknesses in understanding the concepts and principles of flat structure. Student's difficulties factors are the lack of variety of the exercises about flat structure width questions which are relating all concepts that is thought to the students.
Keywords Student's Difficulties; Flat Structure Width; Bilah Keris Sengkelet.

A. INTRODUCTION

Mathematics is one of the subjects that have been taught early on (R. Soedjadi, 2000: 7). One of the materials that teaches geometry material. Geometry is the science of the point, the line, the plane and the spatial objects and their properties, their sizes and relationships with others. The concept of geometry also exists in objects that we can see in everyday life. The mathematics that exist in everyday life for example in indigenous culture. One of the works of art and culture that still exist and survive today is a dagger. This work is a form of craft art, keris has a requirement for the meaning and philosophy of the form up to its usefulness. Kinds of keris very much, one of them is kris sengkelat luk 13. In Keris Sengkelat there are many elements of mathematics. One is the concept of geometry. But still the students are still a lot of questions about the matter about geometry. Difficulties that experienced students will be mistakes when answering test questions (Soedjadi, 1996: 27). In other words, the mistakes made by students in answering test questions are an indicator of the problems they experienced. Depdiknas in 2007 also stated that if a student has difficulty, then he will make mistakes. The difficulties of students in English can not be built alone about the knowledge of mathematical concepts. Learn to memorize math concepts without the meaning contained in

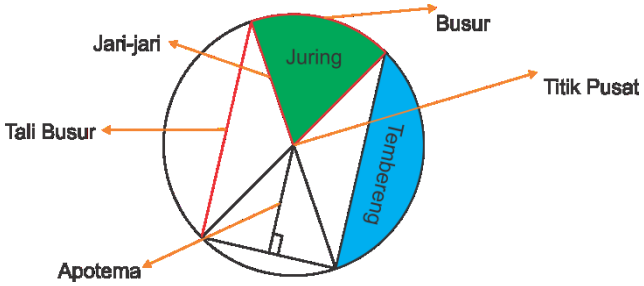
this concept so that when students solve math problems students often make mistakes and find no solution. In line with the results of research conducted Tulus Aprianto (2012: 18) in SMP PGRI Banyubiru already has four levels of error that dominant carelessness or less careful of 66.67%; process skill error 26.04%; misconceptions about 4.17%; errors using notation of 3.13%.

Therefore the researchers will dismantle about what kinds of errors that occur students and factors that are the cause of error class VIII SMPIT Baitussalam students in solving problems wake up on the blade Keris Sengkelat.

B. MATERIAL & METHODS

1. Material

a. Circle



Formula:

Circle Area

$$l\odot = \eth r^2$$

Circumference

$$k\odot = 2\eth r = \eth d$$

Area of Juring

$$lj = \frac{\acute{a}}{360^0} \times l\odot$$

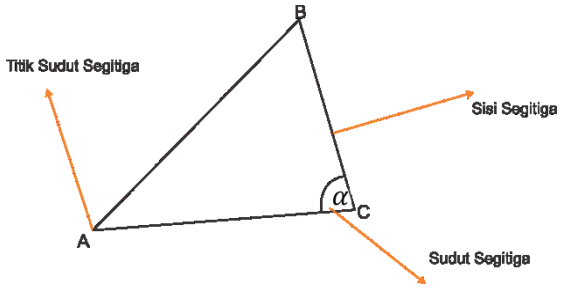
Long arc

$$pb = \frac{\acute{a}}{360^0} \times k\odot$$

Area of Tembereng

$$lt = li - \left(\frac{1}{2}r^2 sin(\acute{a})\right)$$

b. Triangle

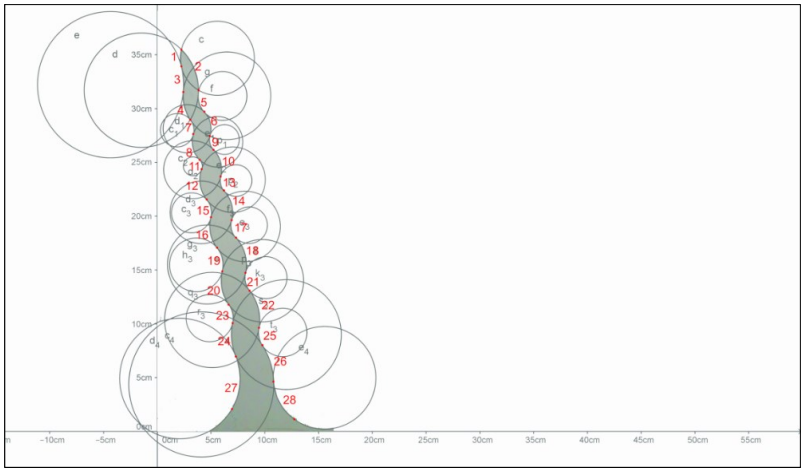


Formula:

Area of triangle

$$l\,\Delta = \frac{1}{2}s_1 s_2 sin(\alpha)$$

c. Luas Bilah Keris Sengkelat



The result of the previous research is the cross sectional area of 75.21 cm^2

2. Methods

This research is a type of descriptive-qualitative research. It is reviewed based on the type of problem (problema) in research that serves to know the status and describe the phenomenon. Meanwhile, if reviewed according to the emergence of variables, then this study includes non-experimental research because in this study was not done a treatment.

The research was conducted in class VIII SMPIT Baitussalam Yogyakarta in the academic year 2017/2018 and was held in October 2017. The subject of the study was the VIII students of SMPIT Baitussalam Yogyakarta who had difficulty in solving the problem in finding the area of flat wake at the Sengkelat Keris Bar. Sampling technique used is purposive sampling, that is sampling technique of data source with certain consideration as according to aim to be achieved. The classes chosen as research subjects were chosen based on the results of the learning observations, the results of daily test scores, the results of discussions with the mathematics teachers are most suitable for collecting data with certain considerations. Then selected several students to be subjected to interviews based on the results of diagnostic tests, considerations and advice of math teachers. Many students are selected tailored to the needs of the data required and in accordance with the type of difficulty students do.

The research procedure refers to Lexy J. Moleong (2007: 127). Simply put, the research design is as follows: (1) Pre-field stage, (2) Research phase, and (3) Stage of data analysis.

C. RESULT & DISCUSSION

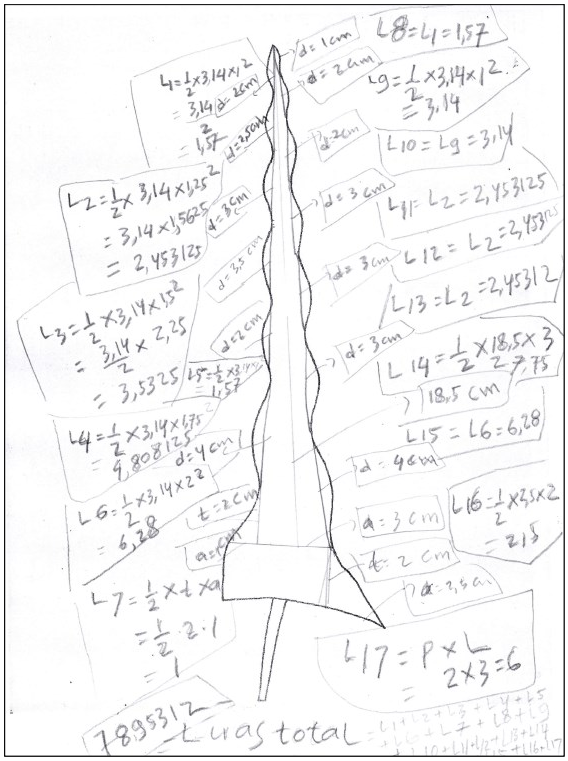
Based on research conducted, researchers can identify student errors in solving the problem of waking flat on the Sengkelat Keris Bar. These errors are made while performing diagnostic tests and deepened by interviews with students. The types of mistakes made by students as follows:

1. Error reading
2. Misunderstanding
3. Error transform
4. Operating error
5. Mistakes due to carelessness

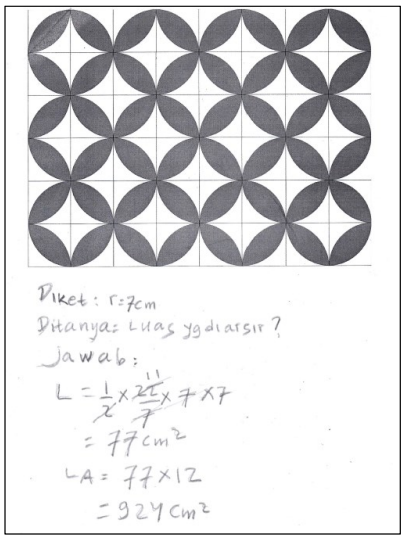
The difficulty of reading to be very crucial when dealing with the problem because if you have one in reading can be sure the next step is wrong and will find the results of the wrong completion as well. Students with visual memory problems can have difficulty recovering visually displayed words. In other words this difficulty leads to errors in the next step. errors in the language aspects are divided into several indicators: (1) students are not able to read the problem correctly, (2) the students do not understand the meaning or meaning of the story on the problem, and (3) the students' inability to retell in their own language. The ability to read the problem correctly should be owned by the students so as not to make a different interpretation for the person who listens to it. Therefore not enough with the ability to read the right, but need to pay attention to the definition of actual reading is a process that involves many things, not just pronunciation of writing, requires interpretation and understanding so that students have good language skills.

Here are the mistakes made by students:

1. Student Work Results S1
   Here are the results of the student work S1 and its analysis

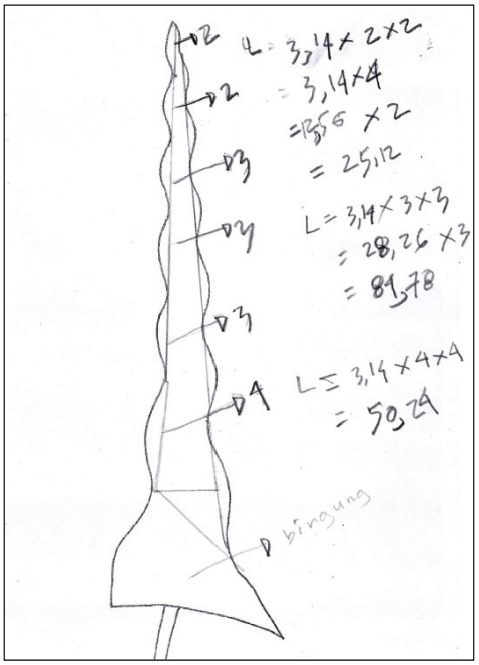


Based on the results of the work of S1 students showed that S1 experienced a misconception of the concept, it was seen from S1 students think Luk on the kris is a semi-circle when in the circle of Luk on the kris is tembereng. In the calculations also students experience recklessness when searching broadly 2 students do not divide by 2 so make a mistake operation. In addition students are not careful in reading so that students make mistakes when looking for area 8. Students consider the middle field just like a triangle when the sides do not form a straight line. Then the errors are confirmed by interview. When the interviewee S1 students consider what has been done is true. Then researchers explore again by showing the new problem as shown below.



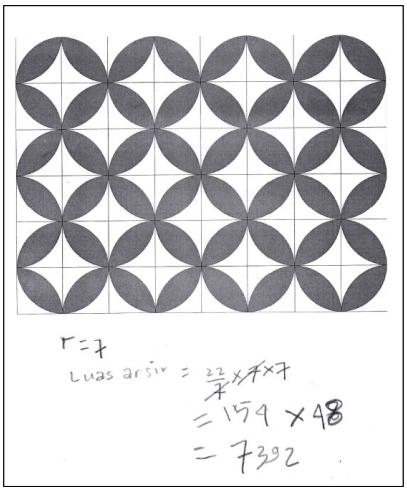
Based on the job, the students have not understood the concept of looking broadly in the circle tembereng. Student S1 assumes that the 4 part boxes are equal to half circle. So the students labeled the shaded area equal to the result of half the sphere multiplied by 12.

2. Student Work Results S2
   Here are the results of S2 student work and its analysis



Based on the students' work shows that the students are not familiar with the concept of the circle where the students consider 2 Luk between the right and the left is a circle. Then the students multiply the same diameter. In addition students also make mistakes in menstransformasikan in formulas where students use diametre to calculate the area when the formula used using the radius. Then researchers further explore with the interview. Having been given problems that support the first problem students also make mistakes in understanding the problem.

Here is the second job result.



S2 students only use the broad formula of the circle without noticing that the shaded drawings are combined from the outer shoemaker.

In addition to knowing the types of mistakes made students, based on student interviews have found the factors that cause the error tesebut, including as follows:

1. Lack of guidance in learning and exploration in learning
2. Lack of variation questions
3. Less learning relates to daily life
4. Students lack the prerequisite material
5. Students are less active in learning activities
6. Students do not deepen the concept

D. CONCLUSION

The types of mistakes made by students as follows:

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Based on the above conclusions and implications, the authors offer some suggestions to overcome the difficulties students make in solving the problems:

1. From the results of the study found that the difficulty of the average student is a misunderstanding. Therefore, teachers should not only emphasize practice exercises but rather emphasize an understanding of concepts. The concepts given to students with particularly low ability should use guided inquiry methods.
2. In learning, for material kesebangunan need to be associated with the context. This is associated with learning with a realistic mathematical approach.
3. Learning should not only rely on students' ability to memorize but more trying to understand the concept. By joint efforts between teachers and students, it is expected that students will not only reach the level of instrumental understanding, but also be able to reach the level of relational understanding in the matter of the circle.
4. In addition to misunderstanding, some students also make mistakes when retrieving information from the problem and when performing the calculation process. Students should be more careful in reading the matter and in doing the calculations. Furthermore, the drill is done, so the material that students can not easily escape from their memory.

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