

# CREATIVE THINKING ABILITY TO SOLVING EQUATION AND NON-EQUATION OF LINEAR SINGLE VARIABLE IN VII GRADE JUNIOR HIGH SCHOOL

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## ABSTRAK

*This study was conducted to determine the level of creative thinking ability of students in learning mathematics. The method used in this study is qualitative methods. The experiment was conducted in class VII-1 junior high school 9 Pematangsiantar in academic year 2015/2016. With the number of students 27 people. There are 50% who reaching the first indicator, there are 45.77% reaching the second indicators, there are 35.18% were reaching the third indicators and 15.74% reaching the fourth indicators 4. The tests uses are essay test to determine the initial ability of students creative thinking abilities.*

**Keywords:** *Students' Creative Thinking Ability*

## Preliminary

Looking for the future, our students have to learning mathematics because the important usefulness in life of the Indonesian Nation. Creativity is something that is overlooked in the study of mathematics. During this time the teacher just put logic and computational ability (calculating) that creativity is considered to be unnecessary in the process of teaching and learning in the classroom. In fact, on the background of 2006 Curriculum stated that creative thinking abilities required to master and create the technology in the future. One of the benefits of mathematics to meet the practical needs and solve daily life problems. Students had to think creatively so that students can solve problems in a variety of different ways Guilford (Park, 2004) Creative thinking is a mental activity that is associated with sensitivity to the problem, consider the new information and ideas that are not usually with an open mind and can create relationships in solving problems. Daniel Fasko, Jr. (2001) that the mathematical creative thinking ability is the mathematics level thinking ability that include by originality, elaboration, flexibility and fluency components. Characteristics of creative thinking that is originality, elaboration, fluency and flexibility. In order for children's creativity can be realized needed a push in the individual (intrinsic motivation) and the encouragement of environmental (extrinsic motivation). From some of the above statement concluded that in order to understand the math requires the ability to think creatively and the results of creative thinking encourages students to be actively involved in the learning of mathematics school. Hwang, W.-Y, et.al (2007) Creativity means the cognitive skills to propose a solution to the

problem. Creativity requires six interrelated elements, namely: intellectual abilities, knowledge, thinking styles, personality, motivation, and environment (Gerard, 1999; Lubart & Sternberg, 1996; Mayer, 1992; Tennyson, 2002) Williams (1971) in Hwang, W.-Y, et.al (2007) Creativity means the cognitive skills of creativity proposes also proposed definition is based on the theory of multiple intelligence Guilford and stressed the importance of creativity in learning. By definition Williams creativity, it consists of six factors: cognitive, eloquence, openness, flexibility, originality, elaboration and four affective factors are curiosity, imagination, challenge, and risk-taking.

From some of the above opinion concluded that the creative thinking ability is needed to solving mathematical problems. Creative thinking is a mental activity that is associated with sensitivity to the problem, consider the new information and ideas that are not usually with an open mind and can create relationships in solving problems.

## Discussion

Learning math need to be designed so that a potentially develop a creative skills thinking of students. Pehkonen (Tatag Yuli, 2007) defines creative thinking as the combination of logical thinking and divergent thinking which is based on intuition but still in consciousness. When a person applying creative thinking in a practice problem solving, divergent thinking to generate new ideas useful in solving the problem. In the two parts of the brain creative thinking will be needed. The balance between logic and creativity are essential. If one puts a logical deduction is too much, then creativity will be neglected. Thus to bring creativity required freedom of thought is not under control and pressure. In line with this, Krulik and Rudnik (Abdul Aziz Saefudin, 2012) mentions that creative thinking is one of the highest levels in a person's thinking, which starts from recall, basic thinking, critical thinking, and creative thinking. Thinking that level over the memory (recall) is called reasoning. While thinking that levels above basic thinking is called higher-level thinking. Hierarchies, levels of thinking is presented in Figure below.



**Figure 1 Hierarchy Thinking (Krulik dan Rudnick)**

On of SKL in mathematics junior high school on PPNo 23 Tahun 2006, the students are expected to have the ability to think logically, analytical, systematic, critical, and creative, and have the ability to work together. But in view of the way students do math at give researchers short of expectations as seen in the figure below:

**Question number 1:** Circumference of a triangle is 167 cm and length of sides are  $(9x-10)$  cm,  $(5x-10)$  cm, dan  $3x$  cm, the longest side is?

Students' answer sheet:

Figure 2. answer sheet in problem number 1

From the figure above, the students answer by un-structure and to solving the problem, the students focused on the formula and had difficulty to find the final solution because they don't know 'what have must to do?'. The student did not use his creative thinking to solving the problem.

**Question number 2:** A 26-years old women has born her baby. What is the age of baby when his mother 50-years old?

Figure 3. answer sheet in problem number 2

The students' final answer is correct, but the process to find final answer is unclearly. The students see confused or hard to describe an idea on their mind. Students' difficulty to describe an idea is a factor of students' creative thinking ability weakness.

**Question Number 3:** The rectangle in length  $(x-1)$  cm and width  $(x+3)$  cm. If the rectangle circumference less than 64 cm. Find the maximum area of that rectangle.

Students' answer sheet:

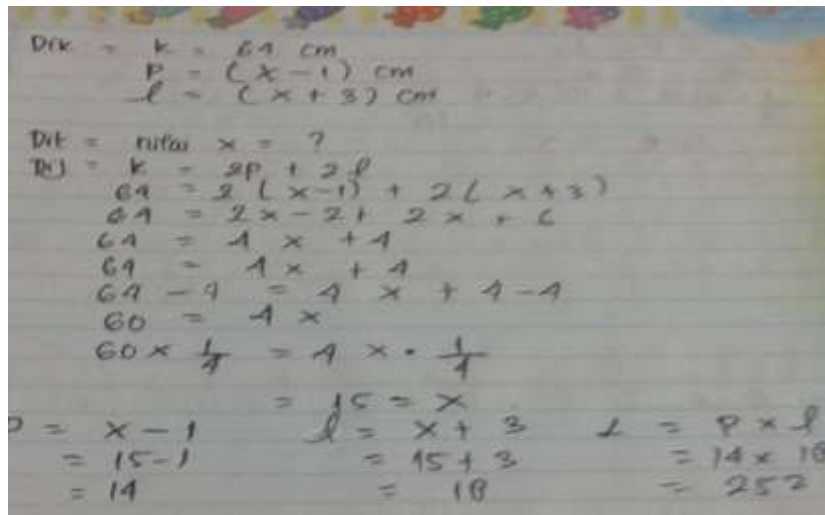


Figure 4 answer sheet in problem number 3

The solving problem steps of students answer above seen nearly perfect. The students not arranged to write the variable rightly and the students answer is true overall. The creativity levels just reach some indicators, student did not think elaborate, where student have to describe the rectangle and redraw and solving the problem without memorizing formulas.

**Question number 4:** The surface of white board resembles a square with size of is  $10x$  cm. If the extent of not less than  $2500 \text{ cm}^2$ . Determine the minimum size of the whiteboard surface.

Student answer sheet:

The most students answer is showing by the figure bellow.

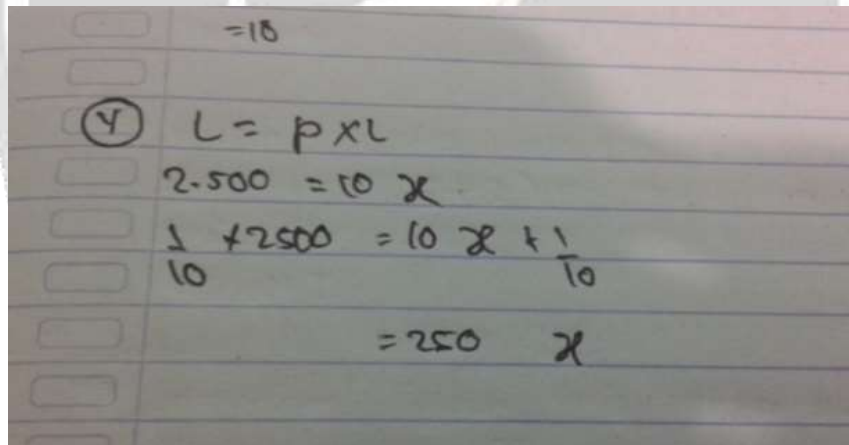


Figure 5. answer sheet in problem number 4

If observed and calculated scores on students' answers, then much of the creativity in which students are less creative in solving problems and also some are not able to answer the questions correctly.

From some students' answers can be concluded that a problem here is the ability to think children are very low in understanding, solving and resolving the problem appropriately.

## Research Result

To determine the level of creative ability in mathematics learning class VII-1 in SMP Negeri 9 Pematang siantar, the researchers tested the ability of creative thinking by using essay test.

**Tabel 1. Initial Test of Students Creative Thinking Ability**

No	Name	Indicators of Creative Thinking Ability															
		(Fluency)				(Flexibility)				(Originality)				(Elaboration)			
		Item Number				Item Number				Item Number				Item Number			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1	AL	2	0	2	0	2	0	2	0	2	0	0	0	2	0	0	0
2	AV	2	0	2	0	2	0	2	0	2	0	0	0	2	0	0	0
3	AN	2	2	2	2	4	4	2	2	2	0	2	2	2	0	2	2
4	AD	2	0	2	2	2	0	2	4	2	0	2	2	2	0	2	0
5	CD	2	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0
6	AZ	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0
7	DN	2	2	2	0	2	4	2	0	0	2	0	0	0	0	0	0
8	DB	2	0	2	0	2	0	2	0	0	0	0	0	0	0	0	0
9	DF	2	0	2	0	2	0	2	0	0	0	0	0	0	0	0	0
10	DS	2	0	2	0	2	0	2	0	0	0	0	0	0	0	0	0
11	EA	2	0	2	0	2	0	2	0	0	0	0	0	0	0	0	0
12	FS	0	0	2	4	0	0	2	4	0	0	0	0	0	0	0	0
13	FA	2	0	2	0	2	0	2	0	0	0	0	0	0	0	0	0
14	FZ	0	2	2	0	0	0	2	0	0	0	2	0	0	0	0	0
15	HR	2	2	2	0	2	0	2	0	0	0	2	0	0	0	0	0
16	IR	2	0	2	0	2	0	2	0	0	0	2	0	0	0	0	0
17	IN	0	0	2	0	0	0	2	0	0	0	2	0	0	0	0	0
18	MR	2	0	2	0	2	0	2	0	0	0	0	0	2	0	0	0
19	RM	0	0	2	0	4	0	2	0	2	0	0	0	2	0	0	0
20	RZ	0	0	2	0	2	0	2	0	2	0	0	0	2	0	0	0
21	RH	2	0	2	0	2	0	2	0	2	0	2	0	2	0	0	0
22	SA	2	2	2	0	2	2	2	0	2	2	2	0	2	2	0	0
23	SAS	2	0	2	0	2	0	2	0	2	0	0	0	2	0	0	0
24	TN	2	2	2	0	2	2	2	0	2	0	0	0	2	0	0	0
25	WN	2	0	2	0	2	0	2	0	2	0	0	0	2	0	0	0
26	IS	2	0	2	0	2	0	2	0	2	0	2	0	2	0	0	0
27	JC	2	0	2	0	2	0	2	0	2	0	2	0	2	0	0	0
Total		44	12	50	8	50	12	50	10	28	4	20	4	28	2	4	2
Indicator Average		28,5				30,5				14				9			

For criteria classification of creative thinking is measured as follow:

Criteria	Criteria
$0 \leq \text{Score} \leq 21$	Uncreative
$22 \leq \text{Score} \leq 43$	Less Creative
$44 \leq \text{Score} \leq 65$	Creative Enough
$66 \leq \text{Score} \leq 87$	Creative
$88 \leq \text{Score} \leq 108$	Very Creative

Source: *The Development of Mathematics Learning Assessment for SD/SMP* (Sumaryanta Estina Ekawati, 2011)

Description Percentage of Students Creative Thinking Ability indicators, namely:

- a. For first indicator, seen the table above the average indicator for item 1 until 4 is 28,5 and categorized Less Creative
- b. For second indicator, seen the table above the average indicator for item 1 until 4 is 30,5 and categorized Less Creative
- c. For third indicator, seen the table above the average indicator for item 1 until 4 is 14 and categorized Uncreative
- d. For fourth indicator, seen the table above the average indicator for item 1 until 4 is 9 and categorized Uncreative

From the above results concluded that the creative thinking ability of students is still low. This means that students' thinking skills in solving problems in creative or categorize still far less than expected as expectations in PP No. 23 of 2006. It is also factored basic math skills of students who do not have the knowledge base to think and solve the mathematical problem, where Feldhusen and Westby (2003) at the Eric L. Mann (2007) suggested that the knowledge base of the individual as the fundamental source of creative thinking of students and is also related to the statement of Eric L. Mann (2007) that students who have not achieved sufficient knowledge and math skills then it can not show the creative thinking of mathematics because they do not have enough knowledge base and experience to express their creative minds to solve mathematical problems.

## Closing

Creative thinking is a mental activity that is associated with sensitivity to the problem, consider the new information and ideas that are not usually with an open mind and can create relationships in solving problems. Characteristics of creative thinking that is originality, elaboration, fluency and flexibility. Creative thinking is one of higher level human thinking that start by *recall*, *basic thinking*, *critical thinking*, and *creative thinking*. The thinking levels upper by memory are called *reasoning*.

The creative thinking ability indicators are:

1. Fluency
2. Flexibility
3. Originality
4. Elaboration

See it in the result research, can be conclude that the thinking ability of students is still low; the average of first indicators is 28,5; the average of second indicators is 30,5; the average of third indicators is 14; and the average of fourth indicators is 9.

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