# LIST OF CONTENT

Content	Page
Legitimation Sheet	i
Biography	ii
Abstract	iii
Preface	iv
List of Content	vi
List of Table	ix
List of Figure	xi
List of Appendix	xiii
CHAPTER I INTRODUCTION	
1.1 Background	1
1.2 Problem Identification	8
1.3 Problem Limitation	8
1.4 Problem Formulation	8
1.5 Research Objectives	8
1.6 Research Benefit	9
1.7 Operational Definitions	9
CHAPTER II RELATED LITERATURE	
2.1 Theoretical Framework	10
2.1.1 Learning Mathematics	10
2.1.2 Learning Activity	11
2.1.3 Problems Based Learning	13
2.1.3.1 Characteristic of PBL	14
2.1.3.2 The Steps of PBL	15
2.1.3.3 Learning Theory that Supports	17
2.1.3.4 The Advantages and Disadvantages of PBL	20
2.1.4 Open-ended Approach	20
2.1.5 PBL Model with Open-ended Approach	21
2.1.6 Creative Thinking Ability	21
2.1.6.1 Definition of Creative Thinking Ability	21

2.1.6.2 Idexes of Creative Thinking	23
2.1.7 The Materials of Similarity of Planes	25
2.2 The Relevant Research	37
2.3 Conceptual Framework	39
2.4 Hypothesis of Action	41
CHAPTER III RESEARCH METODOLOGY	
3.1 Type of Research	42
3.2 Location and Time of Research	42
3.3 Subject and Object of Research	42
3.3.1 Subject of Research	42
3.3.2 Object of Research	42
3.4 Procedure of Research	42
3.4.1 1 <sup>st</sup> Cycle	43
3.4.1.1 Problem I	43
3.4.1.2 Action Plan I	43
3.4.1.3 Implementation of Action I	44
3.4.1.4 Observation I	45
3.4.1.5 Data Analysis I	45
3.4.1.6 Reflection I 3.4.1 2 <sup>nd</sup> Cycle	46 46
3.5 Instrument and Data Colletion 3.5.1 Test	46 46
3.5.1.1 Mathematical Prior Knowledge Test	46
3.5.1.2 Mathematical Creative Thinking Test	47
3.5.2 Non Test	54
3.5.2.2 Observation of Learning Activity	54
3.6 Data Analysis Technique	54
3.6.1 Creative Thinking Ability Test	54
3.6.2 Observation of Teacher's Activity	55
3.6.3 Observation of Student's Activity	56
3.6.4 Improving of Students' MCTA	57
3.7 Indicator of Success	58

#### CHAPTER IV RESEARCH RESULT AND DISCUSSION

4.1 Description of	f Research Result	59
4.1.1 Researc	h Result Cycle I	59
4.1.1.1	Problem I	59
4.1.1.2	Action Planning I	60
4.1.1.3	Action Implementation I	60
4.1.1.4	Observation and Evaluation in Cycle I	61
4.1.1.5	Reflection I	76
4.1.2 Researc	h Result in Cycle II	82
4.1.2.1	Problem II	82
4.1.2.2	Action Planning II	82
4.1.2.3	Action Implementation II	82
4.1.2.4	Observation and Evaluation in Cycle II	83
4.1.2.5	Reflection II	97
4.2 Research Find	lings	102
4.3 Discussion		103
CHAPTER V CONCL	USSIONS AND SUGGESTIONS	
5.1 Conclussion		108
5.2 Suggestions		108
REFERENCES		110

# LIST OF TABLE

	Pages
Table 1.1. Initial Ability Test Result	5
Table 2.1. The Steps of PBL	15
Table 2.2. The Phases of Piaget's Cognitive Development	17
Table 2.3. The Indicator of Creative Thinking Ability	24
Table 2.4. Results of Pyramid Investigated	30
Table 3.1. Blueprint of Creative Thinking Ability Test I	49
Table 3.2. Blueprint of Creative Thinking Ability Test II	50
Table 3.3 The Expert Validation Results of CTA Test 1	51
Table 3.4 The Expert Validation Results of CTA Test 1	51
Table 3.5 Validity Testing of each Instrument Test in Cycle I	52
Table 3.6 Validity Testing of each Instrument Test in Cycle II	53
Table 3.7 Reliability of CTAT	54
Table 3.8 List of Score's Predicate and Level	55
Table 3.9. Guidelines for Assessment of the Teacher's Ability to Manage	
Learning	56
Table 3.10. The Percentage of Ideal Time of Student's Activity	56
Table 3.11 Interpretation of Gain Normalization	57
Table 4.1 Observation Result of Teachers' Activity in Cycle I	61
Table 4.2 Observation Result of Students' Activity in Cycle I	62
Table 4.3 Result of CTAT for Fluency Indicator	66
Table 4.4 The Classical Completeness for Fluency Indicator in Cycle I	67
Table 4.5 Result of CTAT for Flexibility Indicator	68
Table 4.6 The Classical Completeness for Flexibility Indicator in Cycle I	69
Table 4.7 Result of CTAT for Originality Indicator	71
Table 4.8 The Classical Completeness for Originality Indicator in Cycle I	71
Table 4.9 The Classical Completeness of each Indicator in Cycle I	73
Table 4.10 Result of CTAT in Cycle I	74
Table 4.11 The Classical Completeness of MCTA in Cycle I	75
Table 4.12 Reflection of Cycle I	77
Table 4.13 Observation Result of Teachers' Avtivity in Cycle II	84

Table 4.14 Observation Result of Students' Activity in Cycle II	85
Table 4.15 Result of CTAT for Fluency Indicator	88
Table 4.16 The Classical Completeness for Fluency Indicator in Cycle II	89
Table 4.17 Result of CTAT for Flexibility Indicator	90
Table 4.18 The Classical Completeness for Flexibility Indicator in Cycle II	91
Table 4.19 Result of CTAT for Originality Indicator	91
Table 4.20 The Classical Completeness for Originality Indicator in Cycle II	92
Table 4.21 The Classical Completeness of each Indicator in Cycle II	94
Table 4.22 Result of CTAT in Cycle II	95
Table 4.23 The Classical Completeness of MCTA in Cycle II	96
Table 4.24 Comparison Between Cycle I and Cycle II	97
Table 4.25 Increasing Criteria of Students' CTA	99
Table 4.26 Reflection of Cycle II	99

## LIST OF FIGURE

No	Name of Figure Page	
1.1.	Student's answer Sheet in solving the 1 <sup>st</sup> problem with one way	3
1.2.	Student's answer Sheet in solving the 1 <sup>st</sup> problem more than one way	4
1.3.	Student's answer Sheet in solving the 1 <sup>st</sup> problem more than one way	4
2.1.	Two Coin	25
2.2.	Some Pair of Two Planes	26
2.3.	Two Quadrilateral	26
2.4.	Two Rectangles	27
2.5.	Two Pentagon	28
2.6.	Pyramid	29
2.7.	Two Triangles	31
2.8.	Triangle	31
2.9.	A pair of cars are congruent and not congruent	32
2.10	). A pair of chair are congruent and not congruent	33
2.11	Pens are congruent and not congruent	33
2.12	2. Two paintitngs framed that are congruent	33
2.13	3. Two paintitngs framed that are not congruent	33
2.14	4. Pairs of plane figure that congruent	34
2.15	5. Pairs of plane figure that not congruent	34
2.16	5. Two Rectangles	35
2.17	7. Two Trapezodial	36
3.1.	Procedure of Class Action Research	43
4.1.	Graph of Ideal Time of Students' Activity in Cycle I	63
4.2.	The Diagram Result of CTAT for Fluency Indicator	65
4.3.	The Diagram of Classical Completeness of Fluency Indicator in Cycle I	67
4.4.	Students sheet answer for problem 1 of CTAT	68
4.5.	The Diagram Result of CTAT for Flexibility Indicator	69
4.6.	The Diagram of Classical Completeness of Flexibiity Indicator in Cycle I	70
4.7.	Students sheet answer for problem 1 of CTAT	70
4.8.	The Diagram Result of CTAT for Originality Indicator	71

4.9 The Diagram of Classical Completeness of Originality Indicator in Cycle I	72
4.10. Students sheet answer for problem 1 of CTAT	73
4.11 The Diagram of Classical Completeness of Each Indicator in Cycle I	73
4.12. The Diagram Result of MCTAT in Cycle I	74
4.13. The Diagram of Classical Completeness of MCTA in Cycle I	75
4.14 Graph of Ideal Time of Students' Activity in Cycle II	86
4.15. The Diagram Result of CTAT for Fluency Indicator	89
4.16. The Diagram of Classical Completeness of Fluency Indicator in Cycle II	
	89
4.17. The Diagram Result of CTAT for Flexibility Indicator	90
4.18. The Diagram of Classical Completeness of Flexibiity Indicator in Cycle I	Ι
	91
4.19. The Diagram Result of CTAT for Originality Indicator	92
4.20 The Diagram of Classical Completeness of Originality Indicator in Cycle	II
	93
4.21. Students sheet answer for problem 2 of CTAT	93
4.22 The Diagram of Classical Completeness of Each Indicator in Cycle II	94
4.23. The Diagram Result of MCTAT in Cycle II	95
4.24. The Diagram of Classical Completeness of MCTA in Cycle I	96
4.25 Improving Average Score Throught Cycle I and Cycle II	98
4.26 The Increase of each Indicator from Cycle I to Cycle II Classically	
	104
4.27 The Increase of Percentage MCTA from Cycle I to Cycle II Classically	
	104

## LIST OF APPENDIX

	Page
Appendix 1 Lesson Plan	113
Appendix 2 SAS I	126
Appendix 3 SAS II	128
Appendix 4 SAS III	129
Appendix 5 SAS IV	131
Appendix 6 Mathematical Prior Test	133
Appendix 7 Alternative Solution for Mathematical Prior Test	135
Appendix 8 Guideline for Prior Knowledge Test	140
Appendix 9 Problem Test for Validity Test in Cycle I	141
Appenix 10 Problem Test for Validity Test in Cycle II	144
Appensix 11 Alternative Solution for Validity Test in Cycle I	148
Appendix 12 Alternative Solution for Validity Test in Cycle II	160
Appendix 13 Validation Sheet	181
Appendix 14 Validation of CTA I	199
Appendix 15 Validation of CTA II	202
Appendix 16 The value of r-Product Moment	205
Appendix 17 Reliability of CTAT I	206
Appendix 18 Reliability of CTAT II	208
Appendix 19 MCTA I	210
Appendix 20 MCTA II	214
Appendix 21 Alternative Solution of MCTA I	218
Appendix 22 Alternative Solution of MCTA II	224
Appendix 23 Guideline of Creative Thinking Scoring	234
Appendix 24 Blueprint of CTAT I	235
Appendix 25 Blueprint of CTAT II	236
Appendix 26 Teacher Observation Sheet	237
Appendix 27 Student Observation Sheet	249
Appendix 28 The Result of CTAT I	265
Appendix 29 The Result of CTAT II	270

Appendix 30 The Comparison between Cycle I and Cycle II	274
Appendix 31 Data of Students' Learning Completeness of CTAT	275
Appendix 32 Improving of Students' Mathematical Creative Thinking Ability	276
DOCUMENTATION	277