CHAPTER I
INTRODUCTION

1.1.   Background

Education is a process of changing a person's behavior and ability toward progress and improvement. Education can change a person's mindset to always make innovations and improvements in all aspects of life in the direction of self improvement as develop knowledge insight, able to adjust the daily problems they face, positive attitude and behavior towards the social and natural environment.

Mathematics education has important role because the mathematics is basic science that used in various fields of life. Through the learning of mathematics students are expected to develop critical thinking abilities, logical, systematic, thorough, effective, and efficient in solving problems. Like Cornelius expressed (in Abdurrahman 1999:253) that:

> "Five reasons for studying mathematics because mathematics is:means to think clear and logical, means to solve daily problems, means to know the patterns of relationships and generalization of experience, means to develop creativity, and means to raise awareness towards cultural development."

No doubt anymore that every student must get mathematics subject in school. As the purposes of mathematics have been given in the school, we can see that school mathematics held important role. Generally the purposes of mathematics in the school can be classified become(in http://p4tkmatematika.org/2011/10/peran-fungsi-tujuan-dan-karakteristik-matematika-sekolah/) : 1)formally purpose is emphasize to organize reasoning and form the students personality ,2) material purpose is emphasize to problem solving and apply mathematics. So, it is important to realize benefits of mathematics as a subject that is very important in human civilization, especially in education system in the world.

However, in reality, nowadays Indonesian student's mathematics achievment is still low. The low mathematics achievement is demonstrated by the low value of daily tests, semester, or UN (National Examination) in mathematics. Moreover according to data from the Trends in Mathematics and Science Study (TIMSS),

> "the average score of Indonesian students' mathematics achievement in 1999, 2003, and 2007 in a row were 435, 420, and 433. By the score the

Indonesian students got rank 34th out of 38 countries in 1999, ranked 35th of 46 countries in 2003, and ranked 36th of 49 countries in 2007. The average score of Indonesian students in the TIMSS 2007 substandard of 500, and only reached Low International Benchmark. By these achievements, the average of Indonesian students are only able to recognize a number of basic facts but haven't been able to communicate and relate various topics of science,moreover apply complex and abstract concepts."(Http://litbang.kemdikbud.go.id/detail.php?id=214)

The low student mathematics ability can be seen from the students' mastery towards material. One of way is giving test or a problems about the material to the students. Students errors in solving problems can be one of clues to know how far students master the materials. Therefore, the presence of these errors need to be analyzed and searched by any factors that influence. Thus, informations about errors in solving mathematics problems can be used to improve the quality of teaching and learning activities and ultimately improve student mathematics achievement.

Mathematics consist of four broad insight is algebra, arithmetic, geometry, and analysis. Algebra is one part of mathematics that includes variety of material learned in junior high school. Learning algebra is very useful for students in learning (understanding) and other mathematical material and algebra concepts in higher education. For example, mastery of algebra concepts is helpful to learn the concepts of geometry built flat in search of an angle. For example, the angle of triangle.

According to Walle(2008:1) "Thinking algebra or algebra logic is one of them is to generalize from experience with numbers and calculation, formulate ideas by using a symbol system that are useful, and explore the concept of patterns and function." Thus, through studying algebra well, someone will have analytical abilities. This abilities have an important role in the study of mathematics is relatively complex. Thus, understanding the concepts of algebra operation is essential as a basis for understanding other concepts of mathematical material.
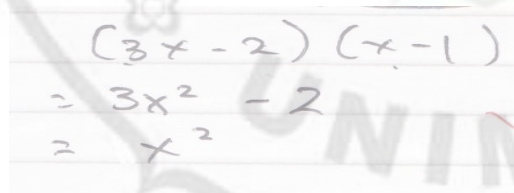
In Medan especially, students' algebra operation abilities is still weak, it is known based on the observations of researcher at three junior high schools in

Medan. The schools were selected by the category of high quality, medium, and low based on the UN in Academic Year 2010/2011. The three schools were SMP Shafiyyatul Amaliyyah with high quality category based on the UN 2010/2011 had an average of mathematics was 9.01; SMP Budisatrya with medium quality category based on the UN 2010/2011 had an average mathematics was 8.90; SMP Negeri14 Medan with low quality category based on the UN 2010/2011had an average mathematics was 7.13. However, after researcher had given tests at the time of observation it appears that the average value of the students in solving problems of algebra operation in SMP Syaffiyatul Amaliyyah only 2.75 from 10; SMP Budisatrya only 1.15 from 10; SMP Negeri 14 Medan only 2.75 from 10 . This is very apprehensive, these schools are still very weak in algebra because many students made errors in algebra operation. The example of students errors in algebra operation is like this:

Problems:

Determine the multiplication of (3x-2)(x-1)

Student answer:

Figure 1.1. Student answer 1

From the student answer, concluded that student made error in transformation errors because student disable identify the sequence of operation, skills process errors because student didn't know the procedure and encoding errors because student error in solution. This could be caused because students have not understanding the concept and principle yet and poorly practise in solving mathematics problem so that made error in skill in algebra operation. If this issues aren't overcomed so the students will dislike mathematics because they feel mathematics is difficult. So that, the student errors must be analyzed and searched what factors that cause it. Detailed error analysis is very needed so that students errors and its factors can be seen further to help overcome these problems.

Many factors cause the low students' mathematics ability. As Slameto (2010:54-72) classified factors of learning, that is internal factor and external factor. Internal factors are physical(health and handicap), physicological (intelligent, careful, interest, talent, motive, maturity, readiness) and weariness factor. While external factors are family (manner of parents educate, relation among member of family, house condition, family economics, parents understanding, background of culture), school (teaching method, curriculum, relation between teacher and student, relation among students, discipline of school, instrument instruction, time of school, standard of subject over measure, facilities, method learning, and homework), and community factor (students activities in community, media mass, friends and life condition of community). In this research the factors will be seen from students and teacher. The factor from student will be analyzed by work result in algebra operation, and the factor from teacher will be analyzed by teacher role in teaching and learning process.

Based on this background, the researcher try to analyze students errors in solving problems of algebra operations. For that, researchers chose the title "Analysis Of Students Errors in Solving Problems of Algebra Operations in Class VIII Medan Junior High School Academic Year 2012/2013". Analysis students errors made by searching errors and factors that cause it. Thus, errors in solving problems of algebra operations can be minimized so that mathematics achievement can be improved.

1.2.   Identification of the Problem

Based on the background, can be identified some of issues that arise in algebra learning are:

1. Students were poorly understand mathematics
2. Almost students made errors in algebra operations
3. Students made errors in transformation, skills process and encoding errors in solving problems of algebra operations.

1.3. Boundary Problems

In order to focus the research, this research only reveals the errors and factors that cause students errors in solving problems of algebra operations in class VIII Medan Junior High School Academic Year 2012/2013.

1.4. Problem Formulation

Based on the boundary problems above, the formulation of the problem is:

1. What kinds of students errors in solving problems of algebra operations in class VIII Medan junior high school Academic Year 2012/2013?

2. What is the level of students errors in solving problems of algebra operations in class VIII Medan junior high school Academic Year 2012/2013?

3. What are the factors that cause the students' errors in solving problems of algebra operations in class VIII Medan junior high school Academic Year 2012/2013?

1.5. Research Purposes

The purposes of this research is:

1. Knowing kinds of students errors in solving problems of algebra operations in class VIII Medan junior high school Academic Year 2012/2013.

2. Knowing the level of students errors in solving problems of algebra operations in class VIII Medan junior high school Academic Year 2012/2013?

3. Knowing the factors that causes students errors in solving problems of algebra operations in class VIII Medan junior high school Academic Year 2012/2013.

1.6.   Benefits of the research

The benefits of this research are as follows:

1.   For teachers

a. Provide information about kinds of students errors in solving problems of algebra operations.

b. Provide information about the factors that causes students errors in solving problems of algebra operations.

c. Provide information about teacher shortage that causes students errors in solving problems of algebra operations so that can give the best solution.

2.   For students

Provide information about students errors so that they can learn more to improve their achievement in mathematics especially in algebra operation.

3.   For Headmaster

a. As a consideration to prepare the school curriculum.

b. Command every teacher make analysis of students errors for each of held material.

4.   For next researchers

As a consideration and input for similar research.

1.7.   Operational Definition

a.   Error

The error is defined as the deviation from the right and its systematic, consistent and incidental to the particular section. Thus, the error is a mistake of the student in solving problems.

b.   Students Error

Students Errors are mistake of the student in solving problems. Analysis of Errors is a description of mistakes made by students in solving problems.