

## **Chapter: I**

### **INTRODUCTION**

#### **Background of the Study**

Mathematics directly deals with the human life. It is believed that the development of mathematics and development of civilization go together. Mathematics is created to fulfill human needs. Mathematics holds the mirror up to the civilization. Mathematics is the science of number and their operation, inter-relation and combination of space configuration their structure and measurement. It is a combination tools. Mathematics is used as an essential tool in many field including natural science, engineering, medicine, finance, social science and art etc.

Mathematics as an expression of the human mind reflects the active will, the contemplative reason, and the desire for aesthetic perfection. Its basic elements are logic and intuition, analysis and construction, generality and individuality. Though different traditions may emphasize different aspects, it is only the interplay of these-antithetic forces and the struggle for their synthesis that constitution the life, usefulness, and supreme value of mathematical science (Stewart, 2012).

Achievement is the tool for evaluating students, which helps to determine the quality of student in their related area. The popular and reliable evaluating tool for student is examination. There are different types of examination to scale student achievement in different level. The level of student is determined by evaluation applying different tools of achievement. The tools of achievement are examination such as oral, written, practical etc.

Learning can be defined as a modification of behavior through experience. It is the permanent change in behavior. Learning is not measurable but it can be change behavior. Learning is a lifelong process. Learning takes place through birth to death that enable the learners for gaining skill to solve daily problem his/her life. Gate defines learning is modification of behavior through experience and training. Crow and Crow define learning is the acquisition habits knowledge and attitude. Gagne defines learning as a change in human behavior. So above definitions say that learning is change of behavior. It is the process of acquiring new knowledge and new responses. Learning doesn't take in place vacuum. Learning is the product of environment. Many factors affect learning such that, personal factor, mental factor, emotional factor, school environment, heredity, teacher role, home environment (Pandit ,2068).

Soares and Collares(2006) was of the view that family income resources, which include the existence of some goods in the students house like the number of bathrooms, car, TV, vacuum cleaner, computer, the number of family member per room in the student house the existence of house maid and whether or not the student works always have to be consider in research on students. Families that highly value their children education, spend proportionally, more on cultural goods and other schooling resources.

UNESCO (1991) in an article entitled “parent learning support system”. It is written: the foremost responsibility of the parent is to bring further children that are assets to the family, to the community and to the wider societies, the country, children, guardian and the resident of community where the children belong equally grow capable of productive and beneficial participation in the varied process which take place in their

immediate as well as extend environment i.e. in social, economic, cultural and other process of disenable human value.

The meaning of environment is the condition that controls the behaviors and development or achievement of somebody or something. Here environment is defines as the condition of family with different variable of basic and extra need such that social economic statuses of family, parent's education, parent spend time for their children and parent visiting school. Therefore environment directly affects the children behaviors and achievement.

A home is a place where one lives permanently, especially as a member of a family or household. It is a place of residence or refuge. A home is not a mere transient shelter. Its essence lies in the personalities of the people who live in it (Authonia, 2014). The home environment is one of the most important factor on which the student can learn easily. The home is the foundation for the learning activities of any child. Sociologists refer to the home as the bedrock of the learning process. So home environment is defined as a socio-economic status, parent's education status, and different language, culture of the community where the child comes.

The home environment means the family background of the students. This includes all the human and material resources present at the home that affect the student education and learning; such as the parents' level of education, their occupation, socio - economic status and socialization facilities available in the house. Thus the home is the basics institution for providing the child primary socialization and laying the educational

foundation for the child upon which the other agent of socialization are built ( Egunsol, 2014).

UNESCO (2000) stated: “Pupils who come from homes with high socio-economic status (SES) as measured by factors such as family income, parent education and book in the home, consistently score better on measure of achievement than pupils from low SES family. This is pattern that applies to countries of all kinds, including developed nations that have taken steps to guarantee equal educational opportunities for all”.

Achievement is determined by different variables such as school related variables, students related variables and household related variables. These variables directly related with student achievement. The school related variable comprise of learning environment at school, experience teacher, qualification of teacher and teaching ability of teacher, location of the school, types of infrastructure of school, teacher ethnic background and student teacher ratio. The Student’s related variable included factors such as gender, age, background, knowledge of mathematics, attendance in class and duration of study at home. The house related variable such as the education of parents, income of the parents, time given to their children for learning.

There are many aspects that impact of the gain knowledge as well as mathematics achievement such as teacher personality, instructional materials, individual differences, peer group, political change, socio-economic status, home environment etc. Among all these aspects, home environment is an important factor which may affect the achievement in mathematics learning.

## **Statement of the Problem**

The purpose statement is a statement that advances the overall direction or focus for the study. Research describe the purpose of a study in one or more succinctly formed sentence and it typically found in the “statement of the problem” (Creswell, 2012). The research entitled “Role of home environment on learning mathematics” is attempted to find out the relation between family incomes, education level and parent involvements on educational achievements of the students. It is said that the first school of the child is home and first teachers are parents. To talk about the educational achievement of the students’ parental socio-economic status which includes income, education level and occupation of the parents play very significant role.

Education is a multifaceted process which may be studied from various perspectives. It is absolutely based on various sociological, political, financial, economical and familiar aspects. The key aim of education is not just to produce academically processed public but autonomous people capable of contributing to their societies and leading dignified happy life. However in the process of learning of children teachers and parents only force the learners to read, but they do not care about the extra linguistic factors like family background that are affecting their learning. Main concern of the parents and teacher is of only the grade and percentage. The students cannot get their communicative competency and psychological development. Most of the parents are not aware of whether they are creating appropriate learning environment at home or not, whether they are assisting their children in learning or not and whether socio-economic status of the parents affect on educational outcomes of the students or not. Considering these issues, I will try to find out the role of home environment in learning mathematics.

- Is the achievement of the student on mathematics affected by their home environment at grade eight?
- How there is relation between home environment and mathematics achievement?

### **Objectives of the Study**

A research objective is a statement of intent used in quantitative research that specifies goal that the investigator plans to achieve in study. The study was intended to determine the following objectives:

- To determine the influence of parent's economic status on student achievement.
- To establish the influence of parents /family involvement on student achievement.
- To examine the influence of family education on student achievements.

### **Hypotheses of the Study**

Hypothesis is the statement in quantitative research in which the investigator makes a prediction or a conjecture about the outcome of relationship among attributes and their characteristic. This study was guided by the null hypotheses.

- There is no significant relationship between parent's economic status and the student academic performance.
- There is no significant relationship between parent's/ family involvement and student performance.
- There is no significant relationship between parent's education and student performance.

### **Signification of the Study**

Mathematics is very useful subject of human life. Home environment provides a network of social, physical, and intellectual force which affects the student mathematics learning. In Nepal there is a lot of investment in education but the outcome is not that much good. It also points out that the guardians are sending their children to school by paying a lot of money, but they are not getting good education as their expectation. So it is very importance to conduct the study at level and any factor that affect the achievement of students. Thus the study is significant for the reason that it would help to identify the factor that affect the learning process. The significations of this study are stated below.

- This study would inform mathematics teachers and students, what are the factors that affect the home environment.
- This study would help to give information about the different mathematics program for the government to solve the students' problems.
- This study would help the mathematics curriculum designers to design better curriculum according to students' different home environment.
- This study would help the parents to understand the effects of the home environment on academic environment and also to improve student academic achievement.

### **Delimitation of the Study**

The following are the limitations of the study:

- This study was delimited on four public school of Rudrapur VDC, Rupandehi.
- This study was delimited only grade eight mathematics teacher as well as students and their parents.

## **Definition of the Related Terms**

**Home environment:** In this study refers to the family where the students are brought up.

**Social economic status:** Refers to financial status of the family.

**High income:** More than 50,000 per year

**Middle income:** Between 30,000 to 50,000 per year

**Low income:** Less than 30,000 per year

**Achievement:** This term is used for mark obtained by the student in examination.

**Parent's:** Parent's means family member of the sample students.

**Student:** The students studying in grade viii on academic years 2073/74 are known as student at public school of Rudrapur VDC.

**Parent's time:** the time provided by the parents to guide their children at home. A value of 1 has been assigned one hour provided time, 2 for two hour provided 3 for three hour provided to their children to care.

**Father's education:** Considering the perceived importance of father's educational status, this variable has been included in this study. A value of 1 has been assigned illiterate, 2 for literate and 3 for educated.

**Mother's education:** Considering the perceived importance of mother's educational status, this variable has been included in this study. A value of 1 has been assigned illiterate, 2 for literate and 3 for educated.



**Illiterate people:** In this category, those people are included who are unable to read and write.

**Literate people:** In this category, those people are included who are able to read and write, also acquiring school education below nine.

**Educated people:** In this category, those people are included who have passed at least nine classes.

**Parent visiting in school:** this variable also has been included which means parent visiting school to collect their children academic activity. A value 1 has been coded for very good, 2 for good and 3 for poor. Where very good mean parents visiting school every month at least for three or more than three time to collect their children academic activities, good means parents visiting school every month at least two time and poor means parents visiting the school every month at least one time to collect their children academic activities.

## **Chapter: II**

### **REVIEW OF LITERATURES**

A literature review is a written summary of journal articles, book and other document that describe the past and current state of information on the topic of your research study (Creswell, 2014). The review of literature enables the researcher to know what is known so far and what is unknown. It helps in conceptualizing the problems, conducting the study and brings the investigator who ignores prior research and theory, chances pursuing trivial problems duplication a study already done, or reporting other mistakes exists. Review of the literature is very important to provide an insight into the problem to familiarize the researcher with the studies previously done and to make the researcher to adopt suitable design. I have reviewed a few research works within my access.

Sah (2000) conducted a study entitle “A Comparative Study of Achievement in Mathematics of lower secondary level student of different ethnic group”. The objective of this study was to find the achievement difference of different ethnic group in Saptary district. The study was of descriptive survey types and achievement test paper was used as the tool. 150 student including Brahimin, Sah and Chaudhary of grade eight from different public school in saptary district was the sample population for the study. The content validity of the test was checked and approved by the mathematics educator of central department of education and mathematics teacher. Several descriptive statistical devices and inferential devices were used to analyze and interpret the collected data. The main conclusion of this research was the achievement of Brahmin student was higher

than Sha and Chaudhary student and Sha students' achievement was higher than Chaudhary students.

Tharu (2005) conducted a study entitled "Impact of Socio-economic Status on Mathematics Achievement" including 140 students of grade ten of the selected four secondary school in Bardia district. Researcher achievement test paper to find the achievement of different socio-economic status student and he also collected all information about socio-economic status by using questionnaire tools for students as well as their parents. From this study researcher found that mathematical achievement of student was strongly associated with the socio-economic status of the children. Those students who achieved good marks in mathematics they came from the good socio-economic status and the student achieved low marks had poor socio-economic status. Similarly the boys' mathematical achievement was found to be strongly associated with father's education, father's income, and father's occupation than of girls and researcher also found that family income had negative effect on mathematical achievement of boy where as it had mild positive effect on mathematics achievement of girls.

Paudel(2009) did a study entitled " Impact of Home Environment on Mathematics Achievement of Ninth Grade". This paper attempts to find the correlation between the mathematics achievement of student and home environment. This study used the survey design and mathematics achievement test papers as well as questionnaire were the tools for this study. Researcher included 80 students of the two schools in Kapilvastu District. Researcher used student questionnaire form and parent's interview schedule to collected data. The data were analyzed using statistical tool such as mean, standard deviation, correlation coefficient and multiple regressions. The researcher found that the

parent's education was highly correlated with mathematics achievement. Family size had a negative correlation with their children's mathematics achievement. Father education highly affect their children achievement. The homework checking had negatively influenced their children mathematics achievement. The researcher concluded that home related variable directly affect student mathematics achievement.

Sharma (2011), conduct a study entitled "The Relationship of Home Environment and Mathematics Achievement of Dalit community at lower secondary level in Baglung and Parbat District". The main objectives of this study to find out the correlation between the facilities provided at home and children's mathematics achievement to analyze the achievement of a student with her/ his parent's education expectation and to suggest for making Dalit better home environment. Researcher used both the descriptive and analytical design to conduct the study. The researcher had taken as the sample for the study 50 students from 50 different families and 5 different school of the Parbat district. This study found most of the parent's expected their children to get their SLC level education and it was found that a significant relationship between parental expectations and the student achievement in mathematics. The mathematics achievement of Dalit student was strongly associated with the variable of facilities at home and parental expectation and the mean score of the availability of the facilities at home was positively correlated with mathematical achievement of the children.

Dibyajyoti (2014) conducted a study entitled "The Role of Home Environment and Mathematics Achievement for Student of Secondary School in Nagaon District, India". The main objective of this study was to point out the different variables in the home environment that determine the achievement of the student. A researcher used the

descriptive method to analyze the impact of attitude toward mathematics in the cortex of selected variables. The sample of this study consisted of 500 student selected from 20 school of Nagaon district. Random sampling method was used to select the sample. A questionnaire was used to collect the data and researcher analyzed the data using the method of SD, t-test, and Karlpearson's product. Researcher found this study had a positive correlation of home environment with academic achievement. Parent should also support their children in their endeavors and provide them with all the help possible. Positive home environment with positive attitude of parents and student were the key factor for successful learning of mathematics. The paper concluded that congenial home environment is essential factor in molding that appetite of the student towards mathematics which influences their overall academic achievement in long run.

Sharma (2015), conduct a study entitled "Impact Home Environment on Mathematics Achievement of Tharu Students". The main objective of the study was to find out the effect of home environment on mathematics achievement of Tharu students. The study used the survey design and research had taken 200 student of the 40 school in Bake district as a sample population. Researcher used student questionnaire form and parent's interview schedule to collected data. The collected data were analyzed using statistical tools, such as mean, stander deviation, inter correlation, t-test, ANNOVA test multiple linear regression. The variable parent's education, parent's occupation, language, time for study, parent's supporting to do homework were found to be strongly related to student achievement in mathematics and family size were found to be low influence on student achievement in mathematics. The researcher concluded that the home environment of the student effect directly in the mathematics achievement.

Jayanthi & Srinivas (2015) conduct a study entitled “Influence of Home Environment on Academic Achievement in Mathematics”. This paper attempted to study the effect of home environment on the academic achievement in mathematics of grade 10<sup>th</sup> students. This study was conducted on 1007 student belong to two district of Tamilnadu, to identify the influence of home environment that could affect student achievement. The researcher used questionnaire to collect the data and tabulated certain data obtained from the test conducted, and suitable analysis was carried out on the same using descriptive and inferential statistics. This study reveals a positive correlation between the home environment and academic achievement of the students towards mathematics.

Khatri (2016) conducts a study entitle “Parent’s involvement on their children Mathematics Achievement”. This paper attempted to find the correlation between the mathematics achievements of student and their parent’s involvement as different role of model of grade 5<sup>th</sup> students. The sample of this study was 120 students belong to two public schools. The researcher used mathematics achievement test and parent questionnaire form as main tool for this study. The mean, standard deviation, correlation and multiple regressions were used to analyze the data related to parent involvement. The researcher found that the achievement of students whose parents were taking more time was better than the less time as a teacher. Similarly mean score of children whose parent always support was higher than other.

Researcher concluded that the different role of parent involvement was very essential to increase the mathematics achievement of students. This research raveled that parent role as teacher affected more than other on mathematics achievement.

From the above review, it can be concluded that there have been many researches worked on achievement of the students and home environment, causes that affect mathematics and factor affecting learning mathematics. Many researchers found that there are many factors such as cultural, physical facility and home environment, teaching learning process, motivation which influenced learning mathematics. In Nepal some studies have been done to explore whether the achievement in mathematics is affected by different variable such as class size, gender, teacher qualification, instructional material, ethnic group. Home environment is the most important role of learning mathematics. The home environment is strongly related to the student performance in mathematics. So, this was the reason that I choose this topic i.e. "Role of home environment on learning mathematics" to conduct my research. The variable of this study are parents' economic status, parents' involvement and parents' education which is differ from the other research.

## **Theoretical Framework**

### **Socio-cultural Theory**

Vygotsky was born in Western Russian in 1896. Vygotsky first big research project was in 1925 with psychology of Art. When the cold war ended, vygotsky work his research in how children solve their problem that surpassed their level of development led vygotsky to create socio-cultural theory or ZPD theory. This theory suggest that social interaction leads to continuous step by step changes in children thought and behavior that can vary greatly from culture to culture. Vygotsky's theory combines the social environment and cognition. Children will acquire the ways of thinking and behaving that make up a culture by interaction with a more knowledgeable person.

Vygotsky believed that social interaction will lead to behavior. These thought and behaviors would vary between cultures (Moll, 1994).

This study will be guided by the socio-cultural theory. The socio-cultural theory has profound implications for teaching, schooling and education. The influence of socio-cultural theory on education has resulted in broadening of our understanding of how children learn and what is their educational achievement. Vygotsky has developed “socio-cultural theory” and believe that children are active seekers of knowledge, but he did not view them as solitary agents. In this theory rich, social and cultural context profoundly affect children cognition. Knowledge is being constructed in social situation of negotiation rather than being the reflection of the objective reality, which is termed as social constructivism.

The children as they go about their daily activities, we can see that they continuously talk loud to themselves as they play and explore the environment. He termed it as “private speech” Vygotsky believed that all higher cognitive process develop out of social interaction. By activating with more mature member of society, children come to master activities and think in way that have meaning in their cultural. Adults who offer an effective scaffold to adjust the assistance the provided to fit the child current levels of performance.

Vygotsky postulated that human knowledge is derived from culture. This means that much of what we know comes from our family and large society. Much of the behavior of young children is rooted in family activities and expectation. Some for instance, have learned at home that hitting back is an acceptable solution to problem



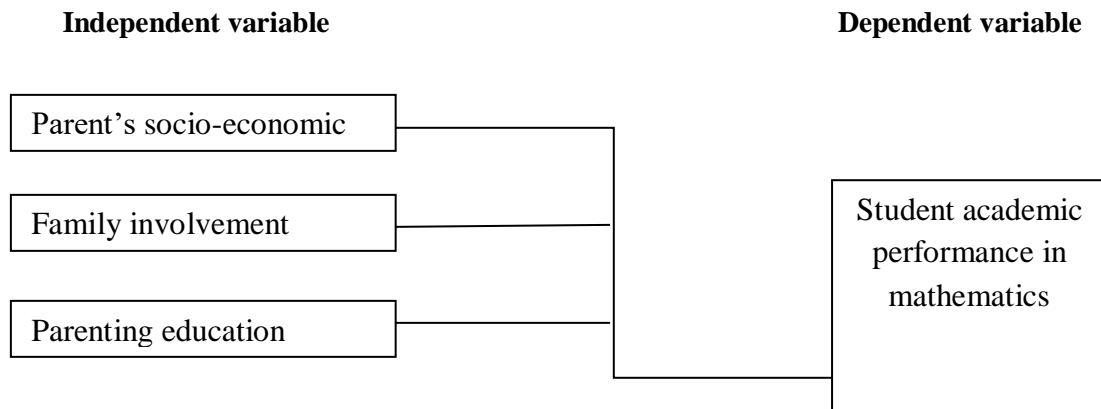
situation with peers or sibling. Children must communicate with parents for gain new knowledge

For vygotsky, the Zone of Proximal Development (ZPD) is the mechanism by which development occurs. This ZPD is technically the difference between what a learner can do independently and what can be done with the help of a more experienced or knowledge able teacher, family member. Note that for the purpose of cognitive development a teacher might be a family member. This approach to understanding cognitive development emphasizes the collaboration between the learners and teacher, family member.

A key feature of this emergent view of human development is that higher order function develops out of social interaction. According to Flear (2002) “socio-cultural theory challenges us to widen our perspective beyond that of individual and of knowledge and meaning in isolation.” Vygotsky's socio-cultural theory of human learning describes learning as a social process and the origination of human intelligence in society or culture. The major theme of Vygotsky's theoretical framework is that social interaction plays a fundamental role in the development of cognition of the students. Socio-economic status is a broad construct representing a family's access to social and economic resources. In my study I have included income of the parents, education level of the parents and the occupation of the parents. The educational levels, as well as income and occupation of parents are interconnected; this is because educated parents, by virtue of their educational background, possess the potential for increased income. Those parents who are educated they make their family educated. They have idea about the life to prepare better as they want.

## Conceptual Framework

In writing this proposal the researcher conceptualized the independent, dependent and intervening variable show in figure.



### Socio-economic Status and Achievements

Socio-economic status is important factor for students' educational success. Socio-economic status is the combination of economic and sociological factors. It's a total measure of a person's work experience and of an individual's or family's economic and social position in relation to others, based on income, educational and occupation. When analyzing a family's socio-economic status, the household income, parent's education and occupation of the parents were examined; socio-economic status is a definite background variable that represents a feature of the social structure in society (Oakes & Rossi, 2003). Socio- economic status has been categorized in three level namely high income, middle income and low income. Family with lower socio-economic status often lacks the financial, social and educational support than that of the families with high socio-economic status. Lower income families have inadequate or limited

access to community resources that promote and support children's development and school readiness.

It is also the fact that families where the parents are privileged educationally socially and economically promote a higher level of achievement of their offspring. They also provide higher level of psychological support for their children through enriched atmosphere that promote and encourage the development of skills required for success at school. The socio-economic status of parents is usually determined by parental education level, parental occupational status and income level (Jeynes 2002).

### **Relation between Parents Involvement and Achievement**

Parent's involvement means the contribution made by the parents for the academic achievement of their children. Parents involvement has been categorized into two ways namely parents visiting school and parents provided time.

Parents visiting school is an activity of seeking the academic achievement of their children by visiting the school. The parents visiting in school was categorized as very good, good and poor where very good means parents visiting school every month at least three or more than three time collection their children academic activities, good means parents visiting school every month at least two times to collect their children academic activities.

Parent provided time is the time spends by the parents in the home for the academic achievements of their children. The time provided by the parents to care their children has been categorized in to three sections as one hour, two hour and four hour.

## **The Relationship between Education Level of Parent's and Educational Achievement of the Students**

Parent's education has very great effect on the overall activities of the students in school. Parents understand the problem of learners' than the teachers. Children stay longer time at home than the school. If parents are educated then they can give more attention to their children and if they are illiterate they are not aware of the children's education. (Merga 1999) states that:

Parents who are themselves educated may have a more enlightened attitude about their children's education, or provide a more stimulating environment for the education of their children than uneducated parent.

Parents education has been studies by categorized into father education and mother education where their education level is measured as educated, literate and illiterate.

Parent's educational level is an important factor that determines students' educational achievement. One of the reasons why literacy strongly affects children's education is because parents who have gone beyond a high school education are found to be more involved with their children than those who did not complete high school (Sclafani, 2004). Many less educated parents simply have more unmanaged stress in their lives, and this stress interests with ability and opportunity to interact with their child. Simply, parents with educated background have a much easier time preparing their children for school and understand what they encountered through learning compared to parents lacking this background.

## **CHAPTER: III**

### **METHODS AND PROCEDURES**

This section explains the design of the study in detail. It includes a detail description of the data in which decision has made about the type of data needed for the study, the data and method using collected the data. This chapter explains the design and method of the study, sample population and sample of the study and instrument used to collect the data.

#### **Design of the Study**

A research design is a plan, structure and strategy of investigation. So conceive as to obtain answer to research question or problem. The plan is the complete schema or programmed of the research. It included an outline of what the investigator will do to form writing the hypothesis and their operation implication to final analysis of data (Kumar, 2011). The study adopted the descriptive survey design. Descriptive survey design was selected because the study entailed asking questions to the large number of people (in the form of the questionnaire) about their opinion and idea and even describes what the people say. This study also used descriptive survey design since the variables were not manipulated and there was an opportunity to explore and probe the respondents for information.

## **Population, Sample and Sampling Strategy**

### **Population**

A population is a group of individual objects or items from which sample are taken for measure while the target population refers to the total of subject. The population of the study consist the compulsory mathematics student of grade eight in Rudrapur VDC in Rupandehi district by using purposive sampling method.

### **Sample and Sampling**

According to Best and Kahn (2003) the ideal sample is that which is large enough to serve as an adequate representation of population about which the researcher wishes to generalize and small enough to be selected economically in term of subject availability, expense in term of time, money and complexity of data analysis. Sampling is the process of selecting a few (a sample) from a bigger group (the sampling population) to become a basis for estimating or predicting a fact, situation or outcome regarding the bigger group (Kumar 2011). The study was conducted on four schools of Rudrapur VDC. The sample of this study was 195 students and teacher of different four schools see the (Appendix D).

### **Data Collection Tools and Instruments**

Two types of instruments were used to collect data and they are mathematics achievement test, questionnaires for parents were developed to collect the data for this study. The mathematics Achievement test was designed and conducted on eight grade student in Rupandehi to assess the level of learning, while parents' survey questionnaires

was developed to collect the data on student family characteristics. The details of each instrument are explained below.

### **Mathematics Achievement test**

The researcher used instrument for measuring mathematics achievement was mathematics achievement test or mathematics test. For this study the researcher constructed an achievement test paper with the help of curriculum and textbook of grade Eight mathematics. Mathematics achievement test was conducted from different areas of mathematics learning arithmetic, algebra, geometry which are regarded as content domain of learning. The mathematics test was designed in line with the national curriculum. Altogether, 8 long questions, 10 short questions and 8 very short questions were included in the test; with the maximum marks of 60 (see the Appendix- A).

### **Questionnaire for parents**

A questionnaire is a written list of questions, the answers to which are recorded by respondents. In a questionnaire respondents read the questions, interpret what is expected and the write down the answer (Kumar, 2011). Parent's questionnaire form was used as a tool for the collection of data in for this survey research. According to the guidance of research supervisor the researcher developed one set of the questionnaire form and to collect the information respondent parents regarding to the parent's education, involvement and income (See Appendix C).

### **Validity and Reliability of the Tools**

The content validity of the questionnaire was established its approval from the mathematics education experts, school teacher and thesis supervisor. For the reliability of

the test paper the researcher carried out pilot test on 20 students of Shree Rudrapur Secondary School, Rudrapur. Before administering the test paper, the researcher instructed the students how to respond the paper.

To determine the internal consistency of the achievement test i.e. to find the reliability of the mathematics achievement test, correlation coefficient had tested. To test the correlation coefficient split half method was applied. Split half method had applied as the odd and even question. After the pilot test the reliability coefficient test had done where the value of 'r' was 0.97(See Appendix-B).

### **Data Collection Procedure**

A researcher obtained an introductory letter from department of education. The researcher visited the identified school for this research for coordination purpose, with the respective authorities. Permission to conduct the research in particular school from the principal of concerned schools. The researcher issued the questionnaires to respondents concerned and arranged them for the completing questionnaires to collect data.

### **Data Analysis Procedure**

This study was intended to make detail of the factors that influence mathematics achievement of Grade- 8 students. Data was analyzed using both descriptive and inferential statistics. Statistical tally system was used to generate frequency count from the responses to prepare of frequency distributions. Percentage was calculated from the responses out of the total student sample response per item. The hypothesis was tested using Pearson's correlation and multiple regressions. The multiple linear regression technique was also used to find the effect of different variable in mathematics



achievement. The analytical design included regression equation pertaining to the effect of five major variables (family income, mother education, father education, time provided and parents visiting in school). The mean, standard deviation, correlation co-efficient, and multiple regressions were used for the data analysis. The mean was used to find the level of mathematics achievement and standard deviation to find the variation of mean. Correlation coefficient was used to determine the relation between dependent and independent variables. Multiple linear regressions were used to find the effect of independent variable on dependent variable. All statistical analysis was determined by using the computer made SPSS version 16.0 program packages. The interpretation of correlation of coefficient (see appendix-E).

## **Chapter-IV**

### **ANALYSIS AND INTERPRETATION OF DATA**

The data for the study were collect from grade VIII student and related parents of sample student from the selected sample. Parent's questionnaire about parent's education, time and student achievement test was used to find out the mathematics achievement score. The collected data were tabulated and analyzed for the study of attainment of the objectives.

The study sought to determine the influence of parent's economics status on student academic performance in public school, to establish the influence of parents involvement on student academic in public school and examine the parent's education on student's academic performance in public school in Rudrapur VDC are the main objectives of this study. The study adopted both descriptive survey designs. Simple random sampling was used to select the sample included in the study. Questionnaire was used as a data collection tool. The collected data were analyzed using both descriptive and inferential statistics using the statistical package for social scientist (SPSS).

The information for this study was gathered by using questionnaire as the main research instrument. The questionnaires were administered to the students, parents and head teacher from the selected school and selected grade.

#### **Family Income**

The family income is one of the concerns for student achievement as the educational instrument like copy, pen, book can only be afford if there is any income. So

the economic crises are also one of the main problems seen in the students in this research. The family income is categorized into three levels as low income, middle income and high income respectively. The mean and standard deviation of the score obtained by student according to parent's income are presented in the following table.

**Table 4.1**  
**Mean and Standard Deviation of Students Achievement by Family Income**

<b>Group</b>	<b>Number of Cases</b>	<b>Mean</b>	<b>S.D</b>
Low income	69	29.78	11.34
Middle income	82	37.05	9.95
High income	44	46.20	9.38

The above table shows that the mean and standard deviation score of students by family income where the mean of low income, middle income and high income are 29.78, 37.05 and 46.20 respectively and the standard deviation of low income, middle income and high income are 11.33, 9.95 and 9.38 respectively.

Therefore the mean score of student with high family income is higher than the low and middle income family student and the mean achievement score of middle income family student is higher than low income family students. The students having high income family have good achievement in mathematics than low and middle.

## Parents' Involvement

In this research the time provided by the parents to care their children has been categorized in to three sections as One Hour, Two Hour and Three Hour or more. The mean and standard deviation of the score of student according to parents time providing is tabulated in following table.

**Table 4.2**  
**Mean and Standard Deviation of Students Achievement by Parents time provided**

<b>Time Provided</b>	<b>Number of Cases</b>	<b>Mean</b>	<b>S.D</b>
One Hour	82	31.18	10.28
Two Hour	59	36.07	9.74
Three Hour or more	54	45.20	11.75

The above table shows that the mean score of the students according to the provided time i.e. one hour, two hour and three or more than three hours are 31.18, 36.07 and 45.20 with the standard deviation of 10.28, 9.74 and 11.76 respectively. The mean score of the students whose parents devoted more time to their children's study was found to be higher than that of less time devoted. The mean score of those students is higher whose parents have provided three or more than three hours than that of the one and two hours of time provided. And similarly the parents who have provided two hour time to their children has a higher mean score than that of the one hour. It is found that, the more the time given to the children leads to the higher achievement.

### **Parent Visiting in School**

In the research the parent visiting in school was categorized as very good, good and poor where very good means parents visiting school every month at least for three or more than three time to collect their children academic activities, good means parents visiting school every month at least two times to collect their children academic activities and the poor means parents who visit the school every month at least one time to collected their children academic activities. The mean and standard deviation score of student according to parents visiting in school is tabulated in following table.

**Table 4.3**

#### **Mean and Standard Deviation of Student Achievement by Parent Visiting in School**

<b>Group</b>	<b>Number of Case</b>	<b>Mean</b>	<b>S.D</b>
Very good	29	42.00	14.17
Good	99	38.11	11.27
Low	67	31.87	10.42

The above table shows that the mean achievement score of student of their parents visiting school at least three or more than three times, at least two times and at least one time are 42.00, 38.11 and 31.87 with the standard deviation 14.17, 11.27 and 10.42 respectively. The mean score of students whose parents visit school at least more than three times is greater than the mean score of student whose parents visit school at least two times and the mean score of students whose parents visit school at least two

time is greater than the mean score of student whose parents visit school at least one time. This can be concluded that parent visiting school effect student mathematics achievement. Whose parents visit schools time to time to collect their children academic activities have greater achievement than other students.

### **Parents Education**

The mean and standard deviation of the score obtained by the student according to the father and mother education are analyzed and stated below.

### **Mother Education**

The mean and standard deviation of the score obtain by the students according to mother education are presented in the following table.

**Table 4.4**

**Mean and Standard Deviation of Students Achievement by Mother Education.**

<b>Group</b>	<b>Number of Cases</b>	<b>Mean</b>	<b>S.D</b>
Illiterate	12	32.00	13.46
Literate	87	34.93	11.61
Educated	96	38.57	11.86

The above table shows that the mean score of students of illiterate, literate and educated mothers are 32.00, 34.93 and 38.57 with the standard deviation 13.46, 11.61 and 11.68 respectively. Therefore the mean score of educated mother's children are higher

than the mean score of literate and illiterate mother's children. It is also shows that the mean score of literate mother's children is higher than illiterate mother children. It shows that the mathematics achievements of educated mother children are better than literate and illiterate mother's children.

### **Father Education**

The mean and standard deviation of the score of student according to father education is tabulated in the following table.

**Table 4.5**

#### **Mean and Standard Deviation of Student Achievement by Father Education.**

<b>Group</b>	<b>Number of Cases</b>	<b>Mean</b>	<b>S.D.</b>
Education	123	40.54	10.69
Literate	68	30.10	10.70
Illiterate	4	19.50	6.137

The above table shows that the mean score of students of educated, literate and illiterate father are 40.54, 30.10 and 19.50 with the standard deviation 10.69, 10.70 and 6.13 respectively. Therefore the mean score of educated father children is higher than the mean score of literate and illiterate father's children. It is also show that the mean score of literate father's children is higher than those of illiterate father. It shows that the mathematics achievement of educated father children is better than literate and illiterate father's children. Therefore the illiterate father's children score has less variation to that

of the educated and literate father's children. Also the educated father's children score has more variation than that of the literate father's children. Then it shows that educated father's children had better achievement in mathematics than that of the literate and illiterate one.

### **Mathematics Achievement and Home Environment Related Variable**

The correlation between mathematics achievement of students and home environment related variables (family income, mother education, father education, time spend, parents visiting school) are presented in the following table:

**Table 4.6**

#### **Correlation between Mathematics Achievement and Parents Related Variables**

<b>Variables</b>	<b>Correlation co-efficient with Students Achievements</b>
Family Income	0.55
Mother Education	0.771
Father Education	0.688
Time provided	0.479
Parents visiting school	0.279

From the above table, it was found that the correlation between mother education and students' mathematics achievement is higher substantial (i.e. 0.77). Similarly, the father education and student' mathematics achievement has a substantial correlation (i.e. 0.688). The correlation of family income and students' mathematics achievement is



moderate (i.e. 0.55). The correlation between time provided by the parents and students' mathematics achievements is moderately correlated (i.e. 0.479). Whereas the correlation between parents visiting school and students' mathematics achievement is low correlated (i.e. 0.279).

Through the above analysis that the mother education is high correlation with mathematics achievement of student. The mother education and father's education have the substantial correlations so it can be understood that they have the significant contributions in the students' mathematics achievements. But family income and parent provided time has moderate correlation and parents visiting school has low correlation. From this, it can be said that parents visiting school has very less contribution on the students' mathematics achievements. So educated family student's mathematics achievement is higher than that of the literate and illiterate one.

### **Inter Correlation between Mathematics Achievement and Home Environment Related Variable**

Inter correlation between mathematics achievements with home environment related variable (family income, mother education, father education, time spend and parents visiting school) are presented in the table below.

**Table 4.7**

**Inter Correlation between Mathematics Achievement and Parents Related Variables**

<b>Variable</b>	<b>Family Income</b>	<b>Mother Education</b>	<b>Father Education</b>	<b>Time Spend</b>	<b>Parent Visiting School</b>
Mathematics Achievement	0.551	0.771	0.688	0.479	0.279
Family Income		0.492	0.473	0.284	0.128
Mother Education			0.644	0.367	0.156
Father Education				0.429	0.182
Time provided					0.091

The above table shows that mathematics achievement is positively correlated with family income, mother education, father education, time provided and parents visiting school. There is substantial correlation between mathematics achievement and mother education. The mother education is high correlation with student mathematics achievement. Now, the variable mother education, father education, family income, time provided and parents visiting school are positively correlated with students' mathematics achievement. The variable family income has a positive correlation with the mother education, father education, parent provided time and parent visiting school. The variable family income is highly correlated with the mother education. The variable mother

education is positively correlation with the father education and time provided and parent visiting school. The variable father education has a positive correlation with time provided and parents visiting school. The variable time provided is positively correlated with family income, mother education, father education and parents visiting school. The variable parents visiting school has a positive correlation with mother education, father education, family income, and time provided. Having analyzed the above table the mathematics achievement of students is substantial correlated with mother education and father education.

### **Regression Analysis between Dependent and Independent Variables**

In this section the home environment related factors on mathematics achievement is analyzed where five independent variables and one dependent variable were used in multiple linear regression model. The result of regression analysis and standardized regression coefficient of independent variable are show in table below.

**Table 4.8**

**Regression and Standardized Co- efficient of Mathematics Achievement and Home  
Related Independent Variables**

Independent Variables	Standardized Co-efficient	Regression Co-efficient	Sig.	R – Value	R <sup>2</sup>	Adj. R <sup>2</sup>
Constants	6.275		0.001	0.85	0.713	0.706
Family Income	4.49	0.151	0.001			
Mother Education	1.79	0.479	0.00			
Father Education	0.206	0.21	0.00			
Time provided	2.120	0.156	0.00			
Parents visiting School	2.913	0.132	0.001			

- a) Dependent Variable: Mathematics Achievement
- b) Prediction Variable (Constant): Family Income, Mother Education, Father Education, Time Provided, Parent Visiting School.

Multiple regressions are used to predict one variable on the basis of several other variables. It is also statistical approach for modeling the linear relationship between Independent variable and Dependent variable. Now Un-standardized Co-efficient indicates how much the Dependent variable varies with an Independent variable when all other independent variables are held constant. Standardize Co-efficient examines effects of Independent variable on a Dependent variable. R value can be considered as one of the measures of the quality of the prediction variable or level of predication. R<sup>2</sup> value can be considered as a proportion of variance in Dependent variables that can be explained by the Independent variable. Adj. R<sup>2</sup> value can be considered to report your data accurately.

The above table illustrates the information of the result analyzed. Based on the test result on the elevation it shows that home environment factors are the significant factors that contribute to the prediction model of the mathematics achievement. The above table shows an R- value (0.85) with adjusted  $R^2$  (0.713) which shows that only 71.3% effect was found in student's achievement by their home environment factor.

However, home environment related factors contribute significantly to the prediction model of mathematics achievement and other factors that might contribute to their achievement up to 28.7%. From the finding the prediction model can be written as the following multiple linear equation.

$$\begin{aligned} \text{Dependent Variable}(Y) &= \text{Constant} + (\text{family income}) x_1 - (\text{mother education}) x_2 \\ &+ (\text{father education}) x_3 + (\text{parent provided time}) x_4 - (\text{parent visiting in school}) x_5 \\ Y &= 6.27 + 0.151x_1 + 0.479x_2 + 0.21x_3 + 0.156x_4 + 0.132x_5 \end{aligned}$$

Among the family income, mother education, father education, time provided and parents visiting in school are the variable. The regression coefficient of mother education is 0.479 which is the highest, so it is most influential factor to increase mathematics achievement of the students. Mother education was found to be positively associated with mathematics. Only 47.9% effect of mother education was found in their student's mathematics achievement. This concludes that the students of educated mother were found to be intellectual than others. This means where there is an increment in mother education so does the mathematics achievement of students.

Similarly the regression coefficient of father education is 0.21 which was also found to be positively associated with mathematics achievement of the students. Only 21% effect of father education was found in their student mathematics achievement. This

means the mathematics achievement of the students increase with the increase in the father education also increase.

Similarly the regression coefficient of parents' time provided is 0.156 which was also found to be positively associated with mathematics achievement of the students. Parent time provided was found to be effective on mathematics achievement. Only 15.6% effect of parent's provided time was found in their student's mathematics achievement. This means the mathematics achievement of students increase with the increase of parent's provided time.

Similarly the regression coefficient of family income is 0.151 which was also found to be positively associated with mathematics achievement of the students. Only 15.1 % effect of family income was found in their student's mathematics achievement. This means the mathematics achievement of students increase with the increase of the family income. The regression coefficient of parent's visiting school is 0.132 which was also found to be positively associated on their children mathematics achievement. Only 11.4% effect was found on their students' achievement. This means the increase of the parent's visiting school also increases the mathematics achievement of students. Mother education, father education, parent's time provided and family income have positive influence on mathematics achievement of students. From the overall analysis of the above table the variable mother education and father education, have more effect than the income, time provided and parents visiting the school. The variable family income and time provided have more effect than the parent visiting school. It means the mother education, family income, father education, parent provided time for student and parents visiting school have positive relationship between the mathematics achievements of students.

## Chapter – V

### SUMMARY, FINDINGS, CONCLUSION AND RECOMMENDATIONS

The first section of this chapter presents the summary of the research the second section present its finding the third section present to conclusion and the last section present recommendations base on the finding of the study.

#### Summary

This study was undertaken to identify the role of home environment on learning mathematics achievement on grade eight. For this study the researcher developed the achievement test paper with the help of prescribed curriculum, district level examination paper and collaboration with mathematics teacher and administration the test in Rudrapur Ma.Vi. Rudrapur for the item analysis of the test and for checking its reliability and validity to the papers. The researcher also developed for parents, teacher and student questionnaire form with the help of supervisor. The achievement test and parent student questionnaire are main instrument used in the study to collect the data.

For this research study the researcher select four public schools with 195 students from Rudrapur VDC. These data were obtained through the parent questionnaire and mathematics achievement test. The mathematics achievement test data was obtained from student achievement in mathematics exam. The parents questionnaire form was developed to get detail information about the parent's income, father education, mother education, time spend parents visiting school.

For the data analyses of the study mean, standard deviation, correlation coefficient inter correlation and multiple regression were used. The mean was used to find

the level of mathematics achievement and standard deviation used to find the variability of mean. The correlation co-efficient was used to determine the relationship between the dependent and independent variable. Inter correlation are used to find the correlation between dependent and independent variable. The multiple regressions were used to find the effect of independent variable i.e. family income. Mother education, father education, time spend and parents visiting school on dependent variable i.e. mathematics achievement.

## **Findings**

The collected data at the first were analyzed by applying tools. Correlation and multiple linear regression statistical analysis the following result were found.

- The mean achievement score of family high income children is higher than the mean achievement score of middle income family children and the mean achievement score of middle income children is higher than the low income family children.
- The mean achievement score of three hour or more time hour provide parent's children higher than the mean score of the two hour time provide parent's children and the mean achievement score of two hour time provide parent's children is higher than the mean achievement at one hour time provide parents children.
- The mean achievement score of educated mother children is higher than the mean achievement score of literate mother children and the mean



achievement score of literate mother children is higher than the mean achievement score of illiterate mother children.

- The mean achievement score of three times visiting in school parents student is higher than the mean achievement score of two time visiting in school parents student and the mean achievement score of two time visiting in school parents student is higher than the one time visiting in school parents student.
- The mean achievement score of educated father children is higher than the mean score of literate father children and the mean achievement score of literate father children is higher than the mean score of illiterate father children.
- The mother education, father education are highly correlated with the mathematics achievement of students.
- The mother education has a high correlation with the mathematics achievement.
- There is positive relationship between the mathematics achievement of student and father education.
- There is positive relationship between the mathematics achievement of student and family income.
- There is positive relationship between the mathematics achievement of student and times provided.
- There is positive relationship between the mathematics achievement of student and parent's visiting in school.

- There is significant relationship between family income and the student mathematics achievement.
- There is significant relationship between father education and the student mathematics achievement.
- There is significant relationship between parent's time provided and the student's mathematics achievement.
- There is significant relationship between parent visiting school and student's mathematics achievement.

## **Conclusions**

From the finding of the study the researcher made the conclusion that the mother education is most contributing factor on their student than the other factor. So mother education is strongly positive associated with mathematics achievement of student. Also the mother education is strongly relationship with the student achievement. It conclusion that the father education and mother education very essential for increasing mathematics achievement of student. The children of time provide by the parent's whose parent were devoted more time to their children study was found to be higher than that at less time devoted parent's children mathematics achievement. The children from educated mother had better mathematics achievement than from the literate and illiterate children. It conclusion that educated mother supports their children to increase the mathematics achievement. The family income, mother education, father education and time spend

were positively correlated with their children mathematics achievement. The parents visiting in school were positively correlation with their student mathematics achievement. Similarly from the regression analysis of the data we can conclude that the father education and mother education are contribution factor on their student than the other factor.

It concluded that the above mother education and father education factors are very essential for increasing the mathematics achievement. Parents are able to increase mathematics achievement by providing almost facilities for reading and writing as well as parents guiding read and writing. Parents education encourage their children is better mathematics achievements.

### **Recommendations**

After conducting this research the investigator found some finding, there are several areas where the investigator would like suggest some recommendation and educations and educational implication for the implication for improvement in mathematics.

- The study of this kind should be conducted at all levels of school and in other subject as well.
- This study was limited to the student of grade eight from four government school. Hence the researcher cannot generalize the finding of this study go all grade and whole country. So the similar study is done regular wise as well as national wise in order to establish the finding of the study.

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**Appendix A**  
**Achievement Test**

Subject: - Mathematics

F.M.: 60

Class: 8

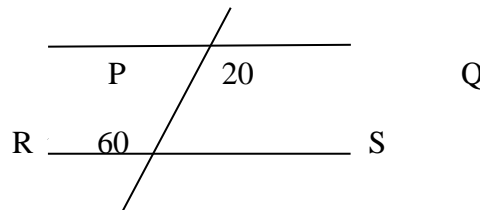
Times: 1: 30 hr

Attempt all the questions

**Group 'A'**

**[8×1= 8]**

1. If  $M=\{1,2,3,4,5\}$  and  $N=\{6,7,8,9\}$ , find  $A \cap B$
2. Find the ratio of 200 m and 4 km.
3. Write the formula to find the principal while rate of interest, duration of getting interest and amount is given.
4. If  $6^n = 1$ , what is the value of n?
5. Find the slope of a line  $4x+5y = 20$ .
6. Are the lines PQ and RS parallel or not in the given figure?

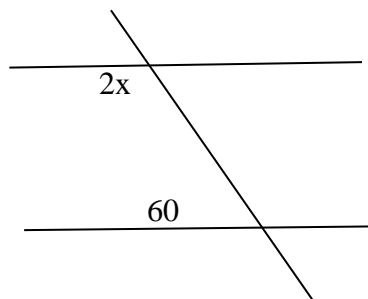


7. Find the distance between the point  $(a, a)$  and  $(2a, 2a)$ .
8. Find the area of the circle which radius is 21cm

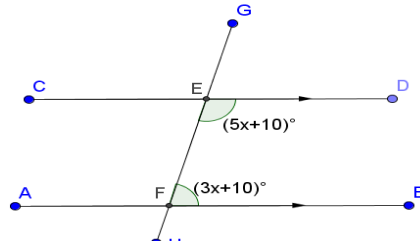
**Group 'B'**

**[10×2= 20]**

1. If  $U =\{1,2,3,4,5\}$ ,  $A=\{2,3\}$  and  $B=\{3,4\}$  then find  $\overline{A \cup B}$
2. How many girls are there in a class of 80 students if 40% are boys?
3. Factorize:  $x^2+11xy+30y^2$
4. Simplify:  $(x + y)^2 - (x-y)^2$
5. Find the value of x in the given figure.



6. Find the mode and range of the given data  
4, 3, 2, 5, 3, 4, 5, 1, 7, 3, 2, 1
7. Find the value of  $x$  if the distance between the points  $P(5, 2)$  and  $Q(x, -2)$  is 5 units.
8. Calculate the value of  $x$  of the adjoining figure?



9. If  $x + \frac{1}{x} = 5$ , find the value of  $x^2 + \frac{1}{x^2}$ .
10. If  $x > 5$  which of the following is the smallest? Give a reason.  
i)  $\frac{5}{x}$     ii)  $\frac{5}{x+1}$     iii)  $\frac{5}{x-1}$     iv)  $\frac{x}{5}$

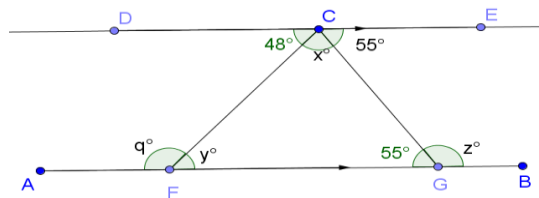
**Group 'C'**

**[8×4=32]**

11. If  $U = \{1, 2, 3, \dots, 9\}$ ,  $A = \{1, 2, 3, 4, 5, 6\}$ ,  $B = \{3, 4, 5, 6, 7\}$  and  $C = \{1, 3, 4, 7, 8\}$ , find  $(B - A) \cup C$  by using a Venn-diagram.
12. Simplify :  $11011_2 + 10011_2 + 11101_2$
13. 24 workers can do a piece of work in 10 days. How many workers should be added to complete the work in 8 days?
14. A watch was bought for Rs. 1200. At what labeled price should it be sold to gain one third after discount of 20%. Find also its selling price.
15. Find the median from the following data:

X	10	12	0	15	16	25	35	32	30
F	2	3	5	4	2	4	3	2	3

16. Find the HCF and LCM:  $x^3 - x$  and  $x^2 - x - 2$
17. Verification sum of interior angle of triangle is  $180^\circ$ .
18. Find the value of  $q$ ,  $x$ ,  $y$  and  $z$ .



***Best of Luck!!!***



## APPENDIX - B

### Reliability coefficient test of the test

S.N.	Score of Odd Item(X)	Score of Even Item(Y)	x <sup>2</sup>	y <sup>2</sup>	x y
1	26	26	676	676	676
2	26	26	675	675	676
3	25	26	625	676	650
4	26	24	675	576	624
5	28	18	784	324	504
6	24	22	576	484	528
7	16	18	256	324	288
8	12	18	144	324	216
9	12	14	144	196	168
10	15	10	225	100	150
11	22	24	484	576	528
12	26	24	676	576	624
13	6	4	36	16	24
14	4	6	16	36	24
15	2	4	4	16	8
16	10	12	100	144	120
17	2	3	4	9	36
18	5	4	25	16	20
19	2	1	4	1	2
20	1	3	1	9	3
total	270	267	6131	5755	5839

$$\begin{aligned}
 \text{Correlation coefficient } (r_{xy}) &= \frac{N\sum xy - \sum x \sum y}{\sqrt{N\sum x^2 - (\sum x)^2} \sqrt{N\sum y^2 - (\sum y)^2}} \\
 &= \frac{20 \times 5839 - 270 \times 267}{\sqrt{20 \times 6131 - 72900} \sqrt{20 \times 5755 - 71289}} \\
 &= 0.95
 \end{aligned}$$

$$\text{Reliability coefficient } (r) = \frac{2r_{xy}}{1+r_{xy}} = \frac{2 \times 0.95}{1+0.95} = 0.97$$

# Appendix 'C'

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## Appendix D

### Row score of the sampled students

#### According to family income

High income	Middle income
1,5,14,37,43,44,48,49,50,52,53,59,63,66,67,68,69,75,85,88,89,90,93,97,99,101,106,114,120,134,135,138,139,140,144,155,156,159,163,164,165,171,172,173,176	2,3,4,6,7,8,9,10,12,13,16,17,18,19,20,21,22,23,24,26,27,28,30,33,39,40,42,47,54,56,57,58,60,61,64,65,78,80,82,83,84,91,100,104,109,115,119,124,125,127,128,130,132,133,136,137,141,143,145,146,147,149,150,151,152,154,158,162,169,174,177,180,182,183,184,186,193,194,195
Low income	
11,15,25,31,32,35,36,29,38,34,41,45,46,51,55,62,70,71,72,73,74,76,77,79,81,86,87,92,94,95,96,98,102,103,105,107,108,110,111,112,113,116,117,118,121,122,123,226,129,131,142,148,157,160,161,166,167,168,170,178,181,185,187,188,189,190,191,192	

#### According to parents time provided

One Hour	Two hour
6,8,9,12,16,17,18,20,21,22,23,24,25,26,27,28,29,31,32,34,35,36,37,38,40,41,44,46,47,55,57,58,61,62,65,67,68,70,71,76,80,86,87,92,94,97,98,102,117,125,126,129,133,142,143,144,145,146,148,149,150,151,157,158,160,161,162,164,166,167,169,170,171,172,174,180,184,185,187,188,189,190,192,	2,3,4,10,11,13,15,19,30,33,39,42,45,49,51,56,59,64,66,72,73,74,77,78,79,83,91,93,100,103,105,108,111,112,113,114,115,116,118,119,120,124,131,139,141,147,152,154,155,163,168,173,176,177,179,183,186,193,194,195
Three or more	
1,5,7,14,43,48,50,52,53,54,60,63,69,75,80,81,82,84,85,88,89,90,95,97,99,101,104,106,107,109,1	

10,121,122,123,124,127,128,130,132,134,135,136,137,138,140,153,156,159,165,175,178,181,182,191

**According to father education**

Education	Literate
1,2,3,4,5,6,7,10,11,12,13,14,15,16,17,18,19,23,25,26,27,28,30,31,32,33,37,41,43,44,48,49,55,52,53,54,57,58,59,60,61,62,63,64,65,66,67,68,,70,72,73,77,78,80,81,82,83,84,87,88,90,93,97,98,100,101,104,106,107,109,110,111,112,117,118,120,122,123,124,125,127,130,133,134,135,137,138,139,140,143,144,147,150,151,152,152,153,155,156,159,160,163,164,165,169,170,171,172,173,174,176,177,180,182,183,184,186,189,191,193	8,9,20,21,24,29,34,35,36,39,40,42,45,46,47,55,56,71,74,77,79,85,86,89,91,92,94,96,99,102,103,105,108,113,115,116,119,121,126,128,129,131,132,136,141,145,146,148,149,154,158,161,162,166,167,168,175,178,179,181,185,187,188,190,192,194,195
Illiterate	
38,76,142,157	

**According to mother education**

Educated	Literate
1,2,3,4,5,10,11,12,13,14,15,19,20,21,22,23,26,27,28,29,41,42,43,44,48,49,50,51,52,53,54,58,59,60,61,62,64,65,67,68,69,70,72,73,77,78,80,81,82,83,86,87,89,92,95,96,98,101,104,106,108,109,110,111,112,114,117,119,120,122,124,127,129,133,134,135,138,139,140,151,152,153,156,159,160,161,165,171,172,174,177,186,189,191,	6,7,8,9,16,17,18,24,30,31,32,33,34,35,37,40,46,47,55,56,57,63,66,71,74,75,79,84,85,88,90,91,93,94,97,99,100,102,103,105,107,113,115,118,121,123,125,126,128,130,131,132,136,137,143,144,146,147,148,149,150,154,155,162,164,166,167,168,169,170,173,175,176,178,179,180,181,182,183,184,185,187,188,189,193,195
Illiterate	
36,38,39,76, 116,141,142,145,157,166,192,194	

--

**According to parent visiting school**

Very good	Good
1,2,3,4,5,6,7,8,38,41,55,64,6 9,75,81,86,87,91 92,93,97,99,100,104,105,12 5, 192,193,194,195	9,10,11,12,13,14,15,16,19,20,21,24,25,27,29,30,32,34,35, 36,40,42,45,46,51,56,58,62,66,68 70,71,74,76,78,79,82,83,84,85,88,89,90,95,98 101,102,103,106,107,108,109,110,111,112,114 115,116,118,119,121,122,123,126,127,128,129 130,131,132,133,135,137,138,139,144,145,146 147,152,153,155,156,157,158,159,163,168,172 173,175,176,177,178,182,183,184,185
<b>Low</b>	
17,18,22,23,26,28,31,33,37,39,43,44,47,48,49,50,52,53,54,57,59,60,61,63,65,67, 72,73,77,80,94,96,113,117,120,134,136,140,141,142,143,148,149,150,151,154, 160,161,162,164,165,166s167,169,170,171,174,179,180,181, ,186,188,187,189,190,191,	

## Appendix E

### Interpretation of correlation coefficient

Coefficient( r)	Relationship
0.00 to 0.20	Negligible
0.20 to 0.40	Low
0.40 to 0.60	Moderate
0.60 to 0.80	Substantial
0.80 to 1.00	High to very high

Source: Best J.W. and Kahn, J.V., P.308

## Chapter: I

### INTRODUCTION

#### Background of the Study

Mathematics directly deals with the human life. It is believed that the development of mathematics and development of civilization go together. Mathematics is created to fulfill human needs. Mathematics holds the mirror up to the civilization.

Mathematics is the science of number and their operation, inter-relation and combination of space configuration their structure and measurement. It is a combination tools.

Mathematics is used as an essential tool in many field including natural science, engineering, medicine, finance, social science and art etc.

Mathematics as an expression of the human mind reflects the active will, the contemplative reason, and the desire for aesthetic perfection. Its basic elements are logic and intuition, analysis and construction, generality and individuality. Though different traditions may emphasize different aspects, it is only the interplay of these-antithetic forces and the struggle for their synthesis that constitution the life, usefulness, and supreme value of mathematical science (Stewart, 2012).

Achievement is the tool for evaluating students, which helps to determine the quality of student in their related area. The popular and reliable evaluating tool for student is examination. There are different types of examination to scale student achievement in different level. The level of student is determined by evaluation applying different tools of achievement. The tools of achievement are examination such as oral, written, practical etc.

Learning can be defined as a modification of behavior through experience. It is the permanent change in behavior. Learning is not measurable but it can be change behavior. Learning is a lifelong process. Learning takes place through birth to death that enable the learners for gaining skill to solve daily problem his/her life. Gate defines learning is modification of behavior through experience and training. Crow and Crow define learning is the acquisition habits knowledge and attitude. Gagne defines learning

as a change in human behavior. So above definitions say that learning is change of behavior. It is the process of acquiring new knowledge and new responses. Learning doesn't take in place vacuum. Learning is the product of environment. Many factors affect learning such that, personal factor, mental factor, emotional factor, school environment, heredity, teacher role, home environment (Pandit ,2068).

Soares and Collares(2006) was of the view that family income resources, which include the existence of some goods in the students house like the number of bathrooms, car, TV, vacuum cleaner, computer, the number of family member per room in the student house the existence of house maid and whether or not the student works always have to be consider in research on students. Families that highly value their children education, spend proportionally, more on cultural goods and other schooling resources.

UNESCO (1991) in an article entitled "parent learning support system". It is written: the foremost responsibility of the parent is to bring further children that are assets to the family, to the community and to the wider societies, the country, children, guardian and the resident of community where the children belong equally grow capable of productive and beneficial participation in the varied process which take place in their immediate as well as extend environment i.e. in social, economic, cultural and other process of disenable human value.

The meaning of environment is the condition that controls the behaviors and development or achievement of somebody or something. Here environment is defines as the condition of family with different variable of basic and extra need such that social economic statuses of family, parent's education, parent spend time for their children and



parent visiting school. Therefore environment directly affects the children behaviors and achievement.

A home is a place where one lives permanently, especially as a member of a family or household. It is a place of residence or refuge. A home is not a mere transient shelter. Its essence lies in the personalities of the people who live in it (Authonia, 2014). The home environment is one of the most important factor on which the student can learn easily. The home is the foundation for the learning activities of any child. Sociologists refer to the home as the bedrock of the learning process. So home environment is defined as a socio-economic status, parent's education status, and different language, culture of the community where the child comes.

The home environment means the family background of the students. This includes all the human and material resources present at the home that affect the student education and learning; such as the parents' level of education, their occupation, socio - economic status and socialization facilities available in the house. Thus the home is the basics institution for providing the child primary socialization and laying the educational foundation for the child upon which the other agent of socialization are built ( Egunsol, 2014).

UNESCO (2000) stated: "Pupils who come from homes with high socio-economic status (SES) as measured by factors such as family income, parent education and book in the home, consistently score better on measure of achievement than pupils from low SES family. This is pattern that applies to countries of all kinds, including

developed nations that have taken steps to guarantee equal educational opportunities for all”.

Achievement is determined by different variables such as school related variables, students related variables and household related variables. These variables directly related with student achievement. The school related variable comprise of learning environment at school, experience teacher, qualification of teacher and teaching ability of teacher, location of the school, types of infrastructure of school, teacher ethnic background and student teacher ratio. The Student’s related variable included factors such as gender, age, background, knowledge of mathematics, attendance in class and duration of study at home. The house related variable such as the education of parents, income of the parents, time given to their children for learning.

There are many aspects that impact of the gain knowledge as well as mathematics achievement such as teacher personality, instructional materials, individual differences, peer group, political change, socio-economic status, home environment etc. Among all these aspects, home environment is an important factor which may affect the achievement in mathematics learning.

### **Statement of the Problem**

The purpose statement is a statement that advances the overall direction or focus for the study. Research describe the purpose of a study in one or more succinctly formed sentence and it typically found in the “statement of the problem” (Creswell, 2012).The research entitled “Role of home environment on learning mathematics” is attempted to find out the relation between family incomes, education level and parent involvements on

educational achievements of the students. It is said that the first school of the child is home and first teachers are parents. To talk about the educational achievement of the students' parental socio-economic status which includes income, education level and occupation of the parents play very significant role.

Education is a multifaceted process which may be studied from various perspectives. It is absolutely based on various sociological, political, financial, economical and familiar aspects. The key aim of education is not just to produce academically processed public but autonomous people capable of contributing to their societies and leading dignified happy life. However in the process of learning of children teachers and parents only force the learners to read, but they do not care about the extra linguistic factors like family background that are affecting their learning. Main concern of the parents and teacher is of only the grade and percentage. The students cannot get their communicative competency and psychological development. Most of the parents are not aware of whether they are creating appropriate learning environment at home or not, whether they are assisting their children in learning or not and whether socio-economic status of the parents affect on educational outcomes of the students or not. Considering these issues, I will try to find out the role of home environment in learning mathematics.

- Is the achievement of the student on mathematics affected by their home environment at grade eight?
- How there is relation between home environment and mathematics achievement?

### **Objectives of the Study**

A research objective is a statement of intent used in quantitative research that specifies goal that the investigator plans to achieve in study. The study was intended to determine the following objectives:

- To determine the influence of parent's economic status on student achievement.
- To establish the influence of parents /family involvement on student achievement.
- To examine the influence of family education on student achievements.

### **Hypotheses of the Study**

Hypothesis is the statement in quantitative research in which the investigator makes a prediction or a conjecture about the outcome of relationship among attributes and their characteristic. This study was guided by the null hypotheses.

- There is no significant relationship between parent's economic status and the student academic performance.
- There is no significant relationship between parent's/ family involvement and student performance.
- There is no significant relationship between parent's education and student performance.

### **Signification of the Study**

Mathematics is very useful subject of human life. Home environment provides a network of social, physical, and intellectual force which affects the student mathematics learning. In Nepal there is a lot of investment in education but the outcome is not that much good. It also points out that the guardians are sending their children to school by

paying a lot of money, but they are not getting good education as their expectation. So it is very importance to conduct the study at level and any factor that affect the achievement of students. Thus the study is significant for the reason that it would help to identify the factor that affect the learning process. The significations of this study are stated below.

- This study would inform mathematics teachers and students, what are the factors that affect the home environment.
- This study would help to give information about the different mathematics program for the government to solve the students' problems.
- This study would help the mathematics curriculum designers to design better curriculum according to students' different home environment.
- This study would help the parents to understand the effects of the home environment on academic environment and also to improve student academic achievement.

### **Delimitation of the Study**

The following are the limitations of the study:

- This study was delimited on four public school of Rudrapur VDC, Rupandehi.
- This study was delimited only grade eight mathematics teacher as well as students and their parents.

### **Definition of the Related Terms**

**Home environment:** In this study refers to the family where the students are brought up.

**Social economic status:** Refers to financial status of the family.

**High income:** More than 50,000 per year

**Middle income:** Between 30,000 to 50,000 per year

**Low income:** Less than 30,000 per year

**Achievement:** This term is used for mark obtained by the student in examination.

**Parent's:** Parent's means family member of the sample students.

**Student:** The students studying in grade viii on academic years 2073/74 are known as student at public school of Rudrapur VDC.

**Parent's time:** the time provided by the parents to guide their children at home. A value of 1 has been assigned one hour provided time, 2 for two hour provided 3 for three hour provided to their children to care.

**Father's education:** Considering the perceived importance of father's educational status, this variable has been included in this study. A value of 1 has been assigned illiterate, 2 for literate and 3 for educated.

**Mother's education:** Considering the perceived importance of mother's educational status, this variable has been included in this study. A value of 1 has been assigned illiterate, 2 for literate and 3 for educated.

**Illiterate people:** In this category, those people are included who are unable to read and write.

**Literate people:** In this category, those people are included who are able to read and write, also acquiring school education below nine.

**Educated people:** In this category, those people are included who have passed at least nine classes.

**Parent visiting in school:** this variable also has been included which means parent visiting school to collect their children academic activity. A value 1 has been coded for very good, 2 for good and 3 for poor. Where very good mean parents visiting school every month at least for three or more than three time to collect their children academic activities, good means parents visiting school every month at least two time and poor means parents visiting the school every month at least one time to collect their children academic activities.

## **Chapter: II**

### **REVIEW OF LITERATURES**

A literature review is a written summary of journal articles, book and other document that describe the past and current state of information on the topic of your research study (Creswell, 2014). The review of literature enables the researcher to know what is known so far and what is unknown. It helps in conceptualizing the problems, conducting the study and brings the investigator who ignores prior research and theory, chances pursuing trivial problems duplication a study already done, or reporting other mistakes exists. Review of the literature is very important to provide an insight into the problem to familiarize the researcher with the studies previously done and to make the researcher to adopt suitable design. I have reviewed a few research works within my access.

Sah (2000) conducted a study entitle “A Comparative Study of Achievement in Mathematics of lower secondary level student of different ethnic group”. The objective of this study was to find the achievement difference of different ethnic group in Saptary district. The study was of descriptive survey types and achievement test paper was used as the tool. 150 student including Brahimin, Sah and Chaudhary of grade eight from different public school in saptary district was the sample population for the study. The content validity of the test was checked and approved by the mathematics educator of central department of education and mathematics teacher. Several descriptive statistical devices and inferential devices were used to analyze and interpret the collected data. The main conclusion of this research was the achievement of Brahmin student was higher



than Sha and Chaudhary student and Sha students' achievement was higher than Chaudhary students.

Tharu (2005) conducted a study entitled "Impact of Socio-economic Status on Mathematics Achievement" including 140 students of grade ten of the selected four secondary school in Bardia district. Researcher achievement test paper to find the achievement of different socio-economic status student and he also collected all information about socio-economic status by using questionnaire tools for students as well as their parents. From this study researcher found that mathematical achievement of student was strongly associated with the socio-economic status of the children. Those students who achieved good marks in mathematics they came from the good socio-economic status and the student achieved low marks had poor socio-economic status. Similarly the boys' mathematical achievement was found to be strongly associated with father's education, father's income, and father's occupation than of girls and researcher also found that family income had negative effect on mathematical achievement of boy where as it had mild positive effect on mathematics achievement of girls.

Paudel(2009) did a study entitled " Impact of Home Environment on Mathematics Achievement of Ninth Grade". This paper attempts to find the correlation between the mathematics achievement of student and home environment. This study used the survey design and mathematics achievement test papers as well as questionnaire were the tools for this study. Researcher included 80 students of the two schools in Kapilvastu District. Researcher used student questionnaire form and parent's interview schedule to collected data. The data were analyzed using statistical tool such as mean, standard deviation, correlation coefficient and multiple regressions. The researcher found that the

parent's education was highly correlated with mathematics achievement. Family size had a negative correlation with their children's mathematics achievement. Father educations highly effect their children achievement. The homework checking had negatively influenced their children mathematic achievement. The researcher concluded that home related variable directly affect student mathematics achievement.

Sharma (2011), conduct a study entitled "The Relationship of Home Environment and Mathematics Achievement of Dalit community at lower secondary level in Baglung and Parbat District". The main objectives of this study to find out the correlation between the facilities provided at home and children's mathematics achievement to analyze the achievement of a student with her/ his parent's education expectation and to suggest for making Dalit better home environment. Researcher used both the descriptive and analytical design to conduct the study. The researcher had taken as the sample for the study 50 students from 50 different families and 5 different school of the Parbat district. This study found most of the parent's expected their children to get their SLC level education and it was found that a significant relationship between parental expectations and the student achievement in mathematics. The mathematics achievement of Dalit student was strongly associated with the variable of facilities at home and parental expectation and the mean score of the availability of the facilities at home was positively correlated with mathematical achievement of the children.

Dibyajyoti (2014) conducted a study entitled "The Role of Home Environment and Mathematics Achievement for Student of Secondary School in Nagaon District, India". The main objective of this study was to point out the different variables in the home environment that determine the achievement of the student. A researcher used the

descriptive method to analyze the impact of attitude toward mathematics in the cortex of selected variables. The sample of this study consisted of 500 student selected from 20 school of Nagaon district. Random sampling method was used to select the sample. A questionnaire was used to collect the data and researcher analyzed the data using the method of SD, t-test, and Karlpearson's product. Researcher found this study had a positive correlation of home environment with academic achievement. Parent should also support their children in their endeavors and provide them with all the help possible. Positive home environment with positive attitude of parents and student were the key factor for successful learning of mathematics. The paper concluded that congenial home environment is essential factor in molding that appetite of the student towards mathematics which influences their overall academic achievement in long run.

Sharma (2015), conduct a study entitled "Impact Home Environment on Mathematics Achievement of Tharu Students". The main objective of the study was to find out the effect of home environment on mathematics achievement of Tharu students. The study used the survey design and research had taken 200 student of the 40 school in Bake district as a sample population. Researcher used student questionnaire form and parent's interview schedule to collected data. The collected data were analyzed using statistical tools, such as mean, stander deviation, inter correlation, t-test, ANNOVA test multiple linear regression. The variable parent's education, parent's occupation, language, time for study, parent's supporting to do homework were found to be strongly related to student achievement in mathematics and family size were found to be low influence on student achievement in mathematics. The researcher concluded that the home environment of the student effect directly in the mathematics achievement.

Jayanthi & Srinivas (2015) conduct a study entitled “Influence of Home Environment on Academic Achievement in Mathematics”. This paper attempted to study the effect of home environment on the academic achievement in mathematics of grade 10<sup>th</sup> students. This study was conducted on 1007 student belong to two district of Tamilnadu, to identify the influence of home environment that could affect student achievement. The researcher used questionnaire to collect the data and tabulated certain data obtained from the test conducted, and suitable analysis was carried out on the same using descriptive and inferential statistics. This study reveals a positive correlation between the home environment and academic achievement of the students towards mathematics.

Khatri (2016) conducts a study entitle “Parent’s involvement on their children Mathematics Achievement”. This paper attempted to find the correlation between the mathematics achievements of student and their parent’s involvement as different role of model of grade 5<sup>th</sup> students. The sample of this study was 120 students belong to two public schools. The researcher used mathematics achievement test and parent questionnaire form as main tool for this study. The mean, standard deviation, correlation and multiple regressions were used to analyze the data related to parent involvement. The researcher found that the achievement of students whose parents were taking more time was better than the less time as a teacher. Similarly mean score of children whose parent always support was higher than other.

Researcher concluded that the different role of parent involvement was very essential to increase the mathematics achievement of students. This research raveled that parent role as teacher affected more than other on mathematics achievement.

From the above review, it can be concluded that there have been many researches worked on achievement of the students and home environment, causes that affect mathematics and factor affecting learning mathematics. Many researchers found that there are many factors such as cultural, physical facility and home environment, teaching learning process, motivation which influenced learning mathematics. In Nepal some studies have been done to explore whether the achievement in mathematics is affected by different variable such as class size, gender, teacher qualification, instructional material, ethnic group. Home environment is the most important role of learning mathematics. The home environment is strongly related to the student performance in mathematics. So, this was the reason that I choose this topic i.e. “Role of home environment on learning mathematics” to conduct my research. The variable of this study are parents’ economic status, parents’ involvement and parents’ education which is differ from the other research.

## **Theoretical Framework**

### **Socio-cultural Theory**

Vygotsky was born in Western Russian in 1896. Vygotsky first big research project was in 1925 with psychology of Art. When the cold war ended, vygotsky work his research in how children solve their problem that surpassed their level of development led vygotsky to create socio-cultural theory or ZPD theory. This theory suggest that social interaction leads to continuous step by step changes in children thought and behavior that can vary greatly from culture to culture. Vygotsky’s theory combines the social environment and cognition. Children will acquire the ways of thinking and behaving that make up a culture by interaction with a more knowledgeable person.

Vygotsky believed that social interaction will lead to behavior. These thought and behaviors would vary between cultures (Moll, 1994).

This study will be guided by the socio-cultural theory. The socio-cultural theory has profound implications for teaching, schooling and education. The influence of socio-cultural theory on education has resulted in broadening of our understanding of how children learn and what is their educational achievement. Vygotsky has developed “socio-cultural theory” and believe that children are active seekers of knowledge, but he did not view them as solitary agents. In this theory rich, social and cultural context profoundly affect children cognition. Knowledge is being constructed in social situation of negotiation rather than being the reflection of the objective reality, which is termed as social constructivism.

The children as they go about their daily activities, we can see that they continuously talk loud to themselves as they play and explore the environment. He termed it as “private speech” Vygotsky believed that all higher cognitive process develop out of social interaction. By activating with more mature member of society, children come to master activities and think in way that have meaning in their cultural. Adults who offer an effective scaffold to adjust the assistance the provided to fit the child current levels of performance.

Vygotsky postulated that human knowledge is derived from culture. This means that much of what we know comes from our family and large society. Much of the behavior of young children is rooted in family activities and expectation. Some for instance, have learned at home that hitting back is an acceptable solution to problem

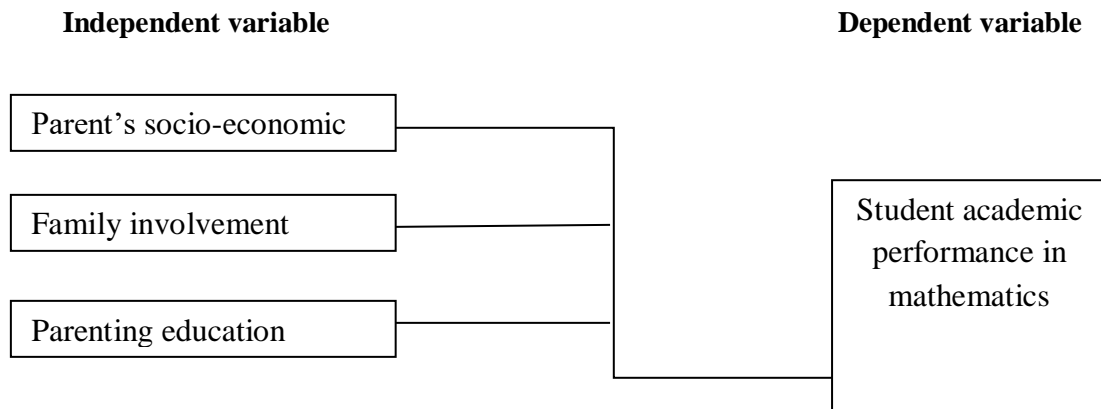
situation with peers or sibling. Children must communicate with parents for gain new knowledge

For vygotsky, the Zone of Proximal Development (ZPD) is the mechanism by which development occurs. This ZPD is technically the difference between what a learner can do independently and what can be done with the help of a more experienced or knowledge able teacher, family member. Note that for the purpose of cognitive development a teacher might be a family member. This approach to understanding cognitive development emphasizes the collaboration between the learners and teacher, family member.

A key feature of this emergent view of human development is that higher order function develops out of social interaction. According to Flear (2002) “socio-cultural theory challenges us to widen our perspective beyond that of individual and of knowledge and meaning in isolation.” Vygotsky's socio-cultural theory of human learning describes learning as a social process and the origination of human intelligence in society or culture. The major theme of Vygotsky's theoretical framework is that social interaction plays a fundamental role in the development of cognition of the students. Socio-economic status is a broad construct representing a family's access to social and economic resources. In my study I have included income of the parents, education level of the parents and the occupation of the parents. The educational levels, as well as income and occupation of parents are interconnected; this is because educated parents, by virtue of their educational background, possess the potential for increased income. Those parents who are educated they make their family educated. They have idea about the life to prepare better as they want.

## Conceptual Framework

In writing this proposal the researcher conceptualized the independent, dependent and intervening variable show in figure.



### Socio-economic Status and Achievements

Socio-economic status is important factor for students' educational success. Socio-economic status is the combination of economic and sociological factors. It's a total measure of a person's work experience and of an individual's or family's economic and social position in relation to others, based on income, educational and occupation. When analyzing a family's socio-economic status, the household income, parent's education and occupation of the parents were examined; socio-economic status is a definite background variable that represents a feature of the social structure in society (Oakes & Rossi, 2003). Socio- economic status has been categorized in three level namely high income, middle income and low income. Family with lower socio-economic status often lacks the financial, social and educational support than that of the families with high socio-economic status. Lower income families have inadequate or limited



access to community resources that promote and support children's development and school readiness.

It is also the fact that families where the parents are privileged educationally socially and economically promote a higher level of achievement of their offspring. They also provide higher level of psychological support for their children through enriched atmosphere that promote and encourage the development of skills required for success at school. The socio-economic status of parents is usually determined by parental education level, parental occupational status and income level (Jeynes 2002).

### **Relation between Parents Involvement and Achievement**

Parent's involvement means the contribution made by the parents for the academic achievement of their children. Parents involvement has been categorized into two ways namely parents visiting school and parents provided time.

Parents visiting school is an activity of seeking the academic achievement of their children by visiting the school. The parents visiting in school was categorized as very good, good and poor where very good means parents visiting school every month at least three or more than three time collection their children academic activities, good means parents visiting school every month at least two times to collect their children academic activities.

Parent provided time is the time spends by the parents in the home for the academic achievements of their children. The time provided by the parents to care their children has been categorized in to three sections as one hour, two hour and four hour.

## **The Relationship between Education Level of Parent's and Educational Achievement of the Students**

Parent's education has very great effect on the overall activities of the students in school. Parents understand the problem of learners' than the teachers. Children stay longer time at home than the school. If parents are educated then they can give more attention to their children and if they are illiterate they are not aware of the children's education. (Merga 1999) states that:

Parents who are themselves educated may have a more enlightened attitude about their children's education, or provide a more stimulating environment for the education of their children than uneducated parent.

Parents education has been studies by categorized into father education and mother education where their education level is measured as educated, literate and illiterate.

Parent's educational level is an important factor that determines students' educational achievement. One of the reasons why literacy strongly affects children's education is because parents who have gone beyond a high school education are found to be more involved with their children than those who did not complete high school (Sclafani, 2004). Many less educated parents simply have more unmanaged stress in their lives, and this stress interests with ability and opportunity to interact with their child. Simply, parents with educated background have a much easier time preparing their children for school and understand what they encountered through learning compared to parents lacking this background.

## **CHAPTER: III**

### **METHODS AND PROCEDURES**

This section explains the design of the study in detail. It includes a detail description of the data in which decision has made about the type of data needed for the study, the data and method using collected the data. This chapter explains the design and method of the study, sample population and sample of the study and instrument used to collect the data.

#### **Design of the Study**

A research design is a plan, structure and strategy of investigation. So conceive as to obtain answer to research question or problem. The plan is the complete schema or programmed of the research. It included an outline of what the investigator will do to form writing the hypothesis and their operation implication to final analysis of data (Kumar, 2011). The study adopted the descriptive survey design. Descriptive survey design was selected because the study entailed asking questions to the large number of people (in the form of the questionnaire) about their opinion and idea and even describes what the people say. This study also used descriptive survey design since the variables were not manipulated and there was an opportunity to explore and probe the respondents for information.

## **Population, Sample and Sampling Strategy**

### **Population**

A population is a group of individual objects or items from which sample are taken for measure while the target population refers to the total of subject. The population of the study consist the compulsory mathematics student of grade eight in Rudrapur VDC in Rupandehi district by using purposive sampling method.

### **Sample and Sampling**

According to Best and Kahn (2003) the ideal sample is that which is large enough to serve as an adequate representation of population about which the researcher wishes to generalize and small enough to be selected economically in term of subject availability, expense in term of time, money and complexity of data analysis. Sampling is the process of selecting a few (a sample) from a bigger group (the sampling population) to become a basis for estimating or predicting a fact, situation or outcome regarding the bigger group (Kumar 2011). The study was conducted on four schools of Rudrapur VDC. The sample of this study was 195 students and teacher of different four schools see the (Appendix D).

### **Data Collection Tools and Instruments**

Two types of instruments were used to collect data and they are mathematics achievement test, questionnaires for parents were developed to collect the data for this study. The mathematics Achievement test was designed and conducted on eight grade student in Rupandehi to assess the level of learning, while parents' survey questionnaires

was developed to collect the data on student family characteristics. The details of each instrument are explained below.

### **Mathematics Achievement test**

The researcher used instrument for measuring mathematics achievement was mathematics achievement test or mathematics test. For this study the researcher constructed an achievement test paper with the help of curriculum and textbook of grade Eight mathematics. Mathematics achievement test was conducted from different areas of mathematics learning arithmetic, algebra, geometry which are regarded as content domain of learning. The mathematics test was designed in line with the national curriculum. Altogether, 8 long questions, 10 short questions and 8 very short questions were included in the test; with the maximum marks of 60 (see the Appendix- A).

### **Questionnaire for parents**

A questionnaire is a written list of questions, the answers to which are recorded by respondents. In a questionnaire respondents read the questions, interpret what is expected and the write down the answer (Kumar, 2011). Parent's questionnaire form was used as a tool for the collection of data in for this survey research. According to the guidance of research supervisor the researcher developed one set of the questionnaire form and to collect the information respondent parents regarding to the parent's education, involvement and income (See Appendix C).

### **Validity and Reliability of the Tools**

The content validity of the questionnaire was established its approval from the mathematics education experts, school teacher and thesis supervisor. For the reliability of

the test paper the researcher carried out pilot test on 20 students of Shree Rudrapur Secondary School, Rudrapur. Before administering the test paper, the researcher instructed the students how to respond the paper.

To determine the internal consistency of the achievement test i.e. to find the reliability of the mathematics achievement test, correlation coefficient had tested. To test the correlation coefficient split half method was applied. Split half method had applied as the odd and even question. After the pilot test the reliability coefficient test had done where the value of 'r' was 0.97(See Appendix-B).

### **Data Collection Procedure**

A researcher obtained an introductory letter from department of education. The researcher visited the identified school for this research for coordination purpose, with the respective authorities. Permission to conduct the research in particular school from the principal of concerned schools. The researcher issued the questionnaires to respondents concerned and arranged them for the completing questionnaires to collect data.

### **Data Analysis Procedure**

This study was intended to make detail of the factors that influence mathematics achievement of Grade- 8 students. Data was analyzed using both descriptive and inferential statistics. Statistical tally system was used to generate frequency count from the responses to prepare of frequency distributions. Percentage was calculated from the responses out of the total student sample response per item. The hypothesis was tested using Pearson's correlation and multiple regressions. The multiple linear regression technique was also used to find the effect of different variable in mathematics

achievement. The analytical design included regression equation pertaining to the effect of five major variables (family income, mother education, father education, time provided and parents visiting in school). The mean, standard deviation, correlation co-efficient, and multiple regressions were used for the data analysis. The mean was used to find the level of mathematics achievement and standard deviation to find the variation of mean. Correlation coefficient was used to determine the relation between dependent and independent variables. Multiple linear regressions were used to find the effect of independent variable on dependent variable. All statistical analysis was determined by using the computer made SPSS version 16.0 program packages. The interpretation of correlation of coefficient (see appendix-E).

## **Chapter-IV**

### **ANALYSIS AND INTERPRETATION OF DATA**

The data for the study were collect from grade VIII student and related parents of sample student from the selected sample. Parent's questionnaire about parent's education, time and student achievement test was used to find out the mathematics achievement score. The collected data were tabulated and analyzed for the study of attainment of the objectives.

The study sought to determine the influence of parent's economics status on student academic performance in public school, to establish the influence of parents involvement on student academic in public school and examine the parent's education on student's academic performance in public school in Rudrapur VDC are the main objectives of this study. The study adopted both descriptive survey designs. Simple random sampling was used to select the sample included in the study. Questionnaire was used as a data collection tool. The collected data were analyzed using both descriptive and inferential statistics using the statistical package for social scientist (SPSS).

The information for this study was gathered by using questionnaire as the main research instrument. The questionnaires were administered to the students, parents and head teacher from the selected school and selected grade.

#### **Family Income**

The family income is one of the concerns for student achievement as the educational instrument like copy, pen, book can only be afford if there is any income. So



the economic crises are also one of the main problems seen in the students in this research. The family income is categorized into three levels as low income, middle income and high income respectively. The mean and standard deviation of the score obtained by student according to parent's income are presented in the following table.

**Table 4.1**  
**Mean and Standard Deviation of Students Achievement by Family Income**

<b>Group</b>	<b>Number of Cases</b>	<b>Mean</b>	<b>S.D</b>
Low income	69	29.78	11.34
Middle income	82	37.05	9.95
High income	44	46.20	9.38

The above table shows that the mean and standard deviation score of students by family income where the mean of low income, middle income and high income are 29.78, 37.05 and 46.20 respectively and the standard deviation of low income, middle income and high income are 11.33, 9.95 and 9.38 respectively.

Therefore the mean score of student with high family income is higher than the low and middle income family student and the mean achievement score of middle income family student is higher than low income family students. The students having high income family have good achievement in mathematics than low and middle.

## Parents' Involvement

In this research the time provided by the parents to care their children has been categorized in to three sections as One Hour, Two Hour and Three Hour or more. The mean and standard deviation of the score of student according to parents time providing is tabulated in following table.

**Table 4.2**  
**Mean and Standard Deviation of Students Achievement by Parents time provided**

<b>Time Provided</b>	<b>Number of Cases</b>	<b>Mean</b>	<b>S.D</b>
One Hour	82	31.18	10.28
Two Hour	59	36.07	9.74
Three Hour or more	54	45.20	11.75

The above table shows that the mean score of the students according to the provided time i.e. one hour, two hour and three or more than three hours are 31.18, 36.07 and 45.20 with the standard deviation of 10.28, 9.74 and 11.76 respectively. The mean score of the students whose parents devoted more time to their children's study was found to be higher than that of less time devoted. The mean score of those students is higher whose parents have provided three or more than three hours than that of the one and two hours of time provided. And similarly the parents who have provided two hour time to their children has a higher mean score than that of the one hour. It is found that, the more the time given to the children leads to the higher achievement.

### **Parent Visiting in School**

In the research the parent visiting in school was categorized as very good, good and poor where very good means parents visiting school every month at least for three or more than three time to collect their children academic activities, good means parents visiting school every month at least two times to collect their children academic activities and the poor means parents who visit the school every month at least one time to collected their children academic activities. The mean and standard deviation score of student according to parents visiting in school is tabulated in following table.

**Table 4.3**

#### **Mean and Standard Deviation of Student Achievement by Parent Visiting in School**

<b>Group</b>	<b>Number of Case</b>	<b>Mean</b>	<b>S.D</b>
Very good	29	42.00	14.17
Good	99	38.11	11.27
Low	67	31.87	10.42

The above table shows that the mean achievement score of student of their parents visiting school at least three or more than three times, at least two times and at least one time are 42.00, 38.11 and 31.87 with the standard deviation 14.17, 11.27 and 10.42 respectively. The mean score of students whose parents visit school at least more than three times is greater than the mean score of student whose parents visit school at least two times and the mean score of students whose parents visit school at least two

time is greater than the mean score of student whose parents visit school at least one time. This can be concluded that parent visiting school effect student mathematics achievement. Whose parents visit schools time to time to collect their children academic activities have greater achievement than other students.

### **Parents Education**

The mean and standard deviation of the score obtained by the student according to the father and mother education are analyzed and stated below.

### **Mother Education**

The mean and standard deviation of the score obtain by the students according to mother education are presented in the following table.

**Table 4.4**

**Mean and Standard Deviation of Students Achievement by Mother Education.**

<b>Group</b>	<b>Number of Cases</b>	<b>Mean</b>	<b>S.D</b>
Illiterate	12	32.00	13.46
Literate	87	34.93	11.61
Educated	96	38.57	11.86

The above table shows that the mean score of students of illiterate, literate and educated mothers are 32.00, 34.93 and 38.57 with the standard deviation 13.46, 11.61 and 11.68 respectively. Therefore the mean score of educated mother's children are higher

than the mean score of literate and illiterate mother's children. It is also shows that the mean score of literate mother's children is higher than illiterate mother children. It shows that the mathematics achievements of educated mother children are better than literate and illiterate mother's children.

### **Father Education**

The mean and standard deviation of the score of student according to father education is tabulated in the following table.

**Table 4.5**

#### **Mean and Standard Deviation of Student Achievement by Father Education.**

<b>Group</b>	<b>Number of Cases</b>	<b>Mean</b>	<b>S.D.</b>
Education	123	40.54	10.69
Literate	68	30.10	10.70
Illiterate	4	19.50	6.137

The above table shows that the mean score of students of educated, literate and illiterate father are 40.54, 30.10 and 19.50 with the standard deviation 10.69, 10.70 and 6.13 respectively. Therefore the mean score of educated father children is higher than the mean score of literate and illiterate father's children. It is also show that the mean score of literate father's children is higher than those of illiterate father. It shows that the mathematics achievement of educated father children is better than literate and illiterate father's children. Therefore the illiterate father's children score has less variation to that

of the educated and literate father's children. Also the educated father's children score has more variation than that of the literate father's children. Then it shows that educated father's children had better achievement in mathematics than that of the literate and illiterate one.

### **Mathematics Achievement and Home Environment Related Variable**

The correlation between mathematics achievement of students and home environment related variables (family income, mother education, father education, time spend, parents visiting school) are presented in the following table:

**Table 4.6**

#### **Correlation between Mathematics Achievement and Parents Related Variables**

<b>Variables</b>	<b>Correlation co-efficient with Students Achievements</b>
Family Income	0.55
Mother Education	0.771
Father Education	0.688
Time provided	0.479
Parents visiting school	0.279

From the above table, it was found that the correlation between mother education and students' mathematics achievement is higher substantial (i.e. 0.77). Similarly, the father education and student' mathematics achievement has a substantial correlation (i.e. 0.688). The correlation of family income and students' mathematics achievement is

moderate (i.e. 0.55). The correlation between time provided by the parents and students' mathematics achievements is moderately correlated (i.e. 0.479). Whereas the correlation between parents visiting school and students' mathematics achievement is low correlated (i.e. 0.279).

Through the above analysis that the mother education is high correlation with mathematics achievement of student. The mother education and father's education have the substantial correlations so it can be understood that they have the significant contributions in the students' mathematics achievements. But family income and parent provided time has moderate correlation and parents visiting school has low correlation. From this, it can be said that parents visiting school has very less contribution on the students' mathematics achievements. So educated family student's mathematics achievement is higher than that of the literate and illiterate one.

### **Inter Correlation between Mathematics Achievement and Home Environment Related Variable**

Inter correlation between mathematics achievements with home environment related variable (family income, mother education, father education, time spend and parents visiting school) are presented in the table below.

**Table 4.7**

**Inter Correlation between Mathematics Achievement and Parents Related Variables**

<b>Variable</b>	<b>Family Income</b>	<b>Mother Education</b>	<b>Father Education</b>	<b>Time Spend</b>	<b>Parent Visiting School</b>
Mathematics Achievement	0.551	0.771	0.688	0.479	0.279
Family Income		0.492	0.473	0.284	0.128
Mother Education			0.644	0.367	0.156
Father Education				0.429	0.182
Time provided					0.091

The above table shows that mathematics achievement is positively correlated with family income, mother education, father education, time provided and parents visiting school. There is substantial correlation between mathematics achievement and mother education. The mother education is high correlation with student mathematics achievement. Now, the variable mother education, father education, family income, time provided and parents visiting school are positively correlated with students' mathematics achievement. The variable family income has a positive correlation with the mother education, father education, parent provided time and parent visiting school. The variable family income is highly correlated with the mother education. The variable mother



education is positively correlation with the father education and time provided and parent visiting school. The variable father education has a positive correlation with time provided and parents visiting school. The variable time provided is positively correlated with family income, mother education, father education and parents visiting school. The variable parents visiting school has a positive correlation with mother education, father education, family income, and time provided. Having analyzed the above table the mathematics achievement of students is substantial correlated with mother education and father education.

### **Regression Analysis between Dependent and Independent Variables**

In this section the home environment related factors on mathematics achievement is analyzed where five independent variables and one dependent variable were used in multiple linear regression model. The result of regression analysis and standardized regression coefficient of independent variable are show in table below.

**Table 4.8**

**Regression and Standardized Co- efficient of Mathematics Achievement and Home Related Independent Variables**

Independent Variables	Standardized Co-efficient	Regression Co-efficient	Sig.	R – Value	R <sup>2</sup>	Adj. R <sup>2</sup>
Constants	6.275		0.001	0.85	0.713	0.706
Family Income	4.49	0.151	0.001			
Mother Education	1.79	0.479	0.00			
Father Education	0.206	0.21	0.00			
Time provided	2.120	0.156	0.00			
Parents visiting School	2.913	0.132	0.001			

c) Dependent Variable: Mathematics Achievement

d) Prediction Variable (Constant): Family Income, Mother Education, Father Education, Time Provided, Parent Visiting School.

Multiple regressions are used to predict one variable on the basis of several other variables. It is also statistical approach for modeling the linear relationship between Independent variable and Dependent variable. Now Un-standardized Co-efficient indicates how much the Dependent variable varies with an Independent variable when all other independent variables are held constant. Standardize Co-efficient examines effects of Independent variable on a Dependent variable. R value can be considered as one of the measures of the quality of the prediction variable or level of predication. R<sup>2</sup> value can be considered as a proportion of variance in Dependent variables that can be explained by the Independent variable. Adj. R<sup>2</sup> value can be considered to report your data accurately.

The above table illustrates the information of the result analyzed. Based on the test result on the elevation it shows that home environment factors are the significant factors that contribute to the prediction model of the mathematics achievement. The above table shows an R- value (0.85) with adjusted R<sup>2</sup> (0.713) which shows that only 71.3% effect was found in student's achievement by their home environment factor.

However, home environment related factors contribute significantly to the prediction model of mathematics achievement and other factors that might contribute to their achievement up to 28.7%. From the finding the prediction model can be written as the following multiple linear equation.

$$\text{Dependent Variable}(Y) = \text{Constant} + (\text{family income}) x_1 - (\text{mother education}) x_2 + (\text{father education})x_3 + (\text{parent provided time})x_4 - (\text{parent visiting in school})x_5$$

$$Y = 6.27 + 0.151x_1 + 0.479x_2 + 0.21x_3 + 0.156x_4 + 0.132x_5$$

Among the family income, mother education, father education, time provided and parents visiting in school are the variable. The regression coefficient of mother education is 0.479 which is the highest, so it is most influential factor to increase mathematics achievement of the students. Mother education was found to be positively associated with mathematics. Only 47.9% effect of mother education was found in their student's mathematics achievement. This concludes that the students of educated mother were found to be intellectual than others. This means where there is an increment in mother education so does the mathematics achievement of students.

Similarly the regression coefficient of father education is 0.21 which was also found to be positively associated with mathematics achievement of the students. Only 21% effect of father education was found in their student mathematics achievement. This

means the mathematics achievement of the students increase with the increase in the father education also increase.

Similarly the regression coefficient of parents' time provided is 0.156 which was also found to be positively associated with mathematics achievement of the students. Parent time provided was found to be effective on mathematics achievement. Only 15.6% effect of parent's provided time was found in their student's mathematics achievement. This means the mathematics achievement of students increase with the increase of parent's provided time.

Similarly the regression coefficient of family income is 0.151 which was also found to be positively associated with mathematics achievement of the students. Only 15.1 % effect of family income was found in their student's mathematics achievement. This means the mathematics achievement of students increase with the increase of the family income. The regression coefficient of parent's visiting school is 0.132 which was also found to be positively associated on their children mathematics achievement. Only 11.4% effect was found on their students' achievement. This means the increase of the parent's visiting school also increases the mathematics achievement of students. Mother education, father education, parent's time provided and family income have positive influence on mathematics achievement of students. From the overall analysis of the above table the variable mother education and father education, have more effect than the income, time provided and parents visiting the school. The variable family income and time provided have more effect than the parent visiting school. It means the mother education, family income, father education, parent provided time for student and parents visiting school have positive relationship between the mathematics achievements of students.

## Chapter – V

### SUMMARY, FINDINGS, CONCLUSION AND RECOMMENDATIONS

The first section of this chapter presents the summary of the research the second section present its finding the third section present to conclusion and the last section present recommendations base on the finding of the study.

#### Summary

This study was undertaken to identify the role of home environment on learning mathematics achievement on grade eight. For this study the researcher developed the achievement test paper with the help of prescribed curriculum, district level examination paper and collaboration with mathematics teacher and administration the test in Rudrapur Ma.Vi. Rudrapur for the item analysis of the test and for checking its reliability and validity to the papers. The researcher also developed for parents, teacher and student questionnaire form with the help of supervisor. The achievement test and parent student questionnaire are main instrument used in the study to collect the data.

For this research study the researcher select four public schools with 195 students from Rudrapur VDC. These data were obtained through the parent questionnaire and mathematics achievement test. The mathematics achievement test data was obtained from student achievement in mathematics exam. The parents questionnaire form was developed to get detail information about the parent's income, father education, mother education, time spend parents visiting school.

For the data analyses of the study mean, standard deviation, correlation coefficient inter correlation and multiple regression were used. The mean was used to find

the level of mathematics achievement and standard deviation used to find the variability of mean. The correlation co-efficient was used to determine the relationship between the dependent and independent variable. Inter correlation are used to find the correlation between dependent and independent variable. The multiple regressions were used to find the effect of independent variable i.e. family income. Mother education, father education, time spend and parents visiting school on dependent variable i.e. mathematics achievement.

## **Findings**

The collected data at the first were analyzed by applying tools. Correlation and multiple linear regression statistical analysis the following result were found.

- The mean achievement score of family high income children is higher than the mean achievement score of middle income family children and the mean achievement score of middle income children is higher than the low income family children.
- The mean achievement score of three hour or more time hour provide parent's children higher than the mean score of the two hour time provide parent's children and the mean achievement score of two hour time provide parent's children is higher than the mean achievement at one hour time provide parents children.
- The mean achievement score of educated mother children is higher than the mean achievement score of literate mother children and the mean

achievement score of literate mother children is higher than the mean achievement score of illiterate mother children.

- The mean achievement score of three times visiting in school parents student is higher than the mean achievement score of two time visiting in school parents student and the mean achievement score of two time visiting in school parents student is higher than the one time visiting in school parents student.
- The mean achievement score of educated father children is higher than the mean score of literate father children and the mean achievement score of literate father children is higher than the mean score of illiterate father children.
- The mother education, father education are highly correlated with the mathematics achievement of students.
- The mother education has a high correlation with the mathematics achievement.
- There is positive relationship between the mathematics achievement of student and father education.
- There is positive relationship between the mathematics achievement of student and family income.
- There is positive relationship between the mathematics achievement of student and times provided.
- There is positive relationship between the mathematics achievement of student and parent's visiting in school.

- There is significant relationship between family income and the student mathematics achievement.
- There is significant relationship between father education and the student mathematics achievement.
- There is significant relationship between parent's time provided and the student's mathematics achievement.
- There is significant relationship between parent visiting school and student's mathematics achievement.

## **Conclusions**

From the finding of the study the researcher made the conclusion that the mother education is most contributing factor on their student than the other factor. So mother education is strongly positive associated with mathematics achievement of student. Also the mother education is strongly relationship with the student achievement. It conclusion that the father education and mother education very essential for increasing mathematics achievement of student. The children of time provide by the parent's whose parent were devoted more time to their children study was found to be higher than that at less time devoted parent's children mathematics achievement. The children from educated mother had better mathematics achievement than from the literate and illiterate children. It conclusion that educated mother supports their children to increase the mathematics achievement. The family income, mother education, father education and time spend



were positively correlated with their children mathematics achievement. The parents visiting in school were positively correlation with their student mathematics achievement. Similarly from the regression analysis of the data we can conclude that the father education and mother education are contribution factor on their student than the other factor.

It concluded that the above mother education and father education factors are very essential for increasing the mathematics achievement. Parents are able to increase mathematics achievement by providing almost facilities for reading and writing as well as parents guiding read and writing. Parents education encourage their children is better mathematics achievements.

### **Recommendations**

After conducting this research the investigator found some finding, there are several areas where the investigator would like suggest some recommendation and educations and educational implication for the implication for improvement in mathematics.

- The study of this kind should be conducted at all levels of school and in other subject as well.
- This study was limited to the student of grade eight from four government school. Hence the researcher cannot generalize the finding of this study go all grade and whole country. So the similar study is done regular wise as well as national wise in order to establish the finding of the study.

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**Appendix A**  
**Achievement Test**

Subject: - Mathematics

F.M.: 60

Class: 8

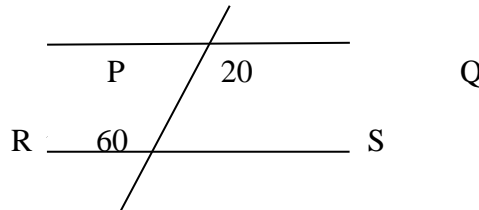
Times: 1: 30 hr

Attempt all the questions

**Group 'A'**

**[8×1= 8]**

9. If  $M=\{1,2,3,4,5\}$  and  $N=\{6,7,8,9\}$ , find  $A \cap B$
10. Find the ratio of 200 m and 4 km.
11. Write the formula to find the principal while rate of interest, duration of getting interest and amount is given.
12. If  $6^n = 1$ , what is the value of n?
13. Find the slope of a line  $4x+5y = 20$ .
14. Are the lines PQ and RS parallel or not in the given figure?

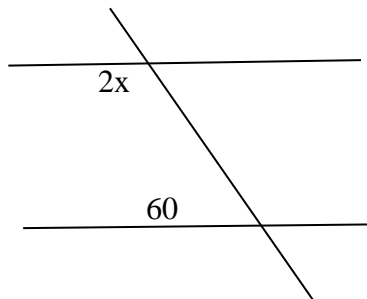


15. Find the distance between the point  $(a, a)$  and  $(2a, 2a)$ .
16. Find the area of the circle which radius is 21cm

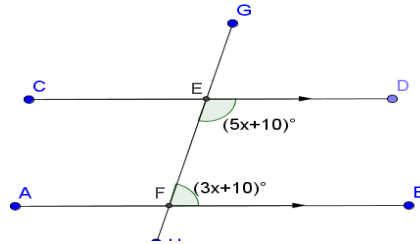
**Group 'B'**

**[10×2= 20]**

19. If  $U = \{1,2,3,4,5\}$ ,  $A = \{2,3\}$  and  $B = \{3,4\}$  then find  $\overline{A \cup B}$
20. How many girls are there in a class of 80 students if 40% are boys?
21. Factorize:  $x^2+11xy+30y^2$
22. Simplify:  $(x + y)^2 - (x-y)^2$
23. Find the value of x in the given figure.



24. Find the mode and range of the given data  
4, 3, 2, 5, 3, 4, 5, 1, 7, 3, 2, 1
25. Find the value of  $x$  if the distance between the points  $P(5, 2)$  and  $Q(x, -2)$  is 5 units.
26. Calculate the value of  $x$  in the adjoining figure?



27. If  $x + \frac{1}{x} = 5$ , find the value of  $x^2 + \frac{1}{x^2}$ .
28. If  $x > 5$  which of the following is the smallest? Give a reason.  
ii)  $\frac{5}{x}$     iii)  $\frac{5}{x+1}$     iv)  $\frac{5}{x-1}$     v)  $\frac{x}{5}$

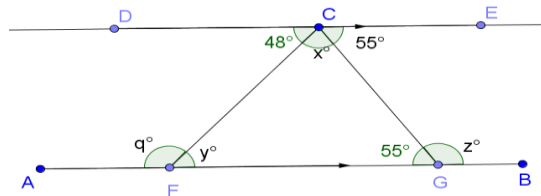
**Group 'C'**

**[8×4=32]**

29. If  $U = \{1, 2, 3, \dots, 9\}$ ,  $A = \{1, 2, 3, 4, 5, 6\}$ ,  $B = \{3, 4, 5, 6, 7\}$  and  $C = \{1, 3, 4, 7, 8\}$ , find  $(B - A) \cup C$  by using a Venn-diagram.
30. Simplify :  $11011_2 + 10011_2 + 11101_2$
31. 24 workers can do a piece of work in 10 days. How many workers should be added to complete the work in 8 days?
32. A watch was bought for Rs. 1200. At what labeled price should it be sold to gain one third after discount of 20%. Find also its selling price.
33. Find the median from the following data:

X	10	12	0	15	16	25	35	32	30
F	2	3	5	4	2	4	3	2	3

34. Find the HCF and LCM:  $x^3 - x$  and  $x^2 - x - 2$
35. Verification sum of interior angle of triangle is  $180^\circ$ .
36. Find the value of  $q$ ,  $x$ ,  $y$  and  $z$ .



***Best of Luck!!!***

## APPENDIX - B

### Reliability coefficient test of the test

S.N.	Score of Odd Item(X)	Score of Even Item(Y)	x <sup>2</sup>	y <sup>2</sup>	x y
1	26	26	676	676	676
2	26	26	675	675	676
3	25	26	625	676	650
4	26	24	675	576	624
5	28	18	784	324	504
6	24	22	576	484	528
7	16	18	256	324	288
8	12	18	144	324	216
9	12	14	144	196	168
10	15	10	225	100	150
11	22	24	484	576	528
12	26	24	676	576	624
13	6	4	36	16	24
14	4	6	16	36	24
15	2	4	4	16	8
16	10	12	100	144	120
17	2	3	4	9	36
18	5	4	25	16	20
19	2	1	4	1	2
20	1	3	1	9	3
total	270	267	6131	5755	5839

$$\begin{aligned}
 \text{Correlation coefficient } (r_{xy}) &= \frac{N\sum xy - \sum x \sum y}{\sqrt{N\sum x^2 - (\sum x)^2} \sqrt{N\sum y^2 - (\sum y)^2}} \\
 &= \frac{20 \times 5839 - 270 \times 267}{\sqrt{20 \times 6131 - 72900} \sqrt{20 \times 5755 - 71289}} \\
 &= 0.95
 \end{aligned}$$

$$\text{Reliability coefficient } (r) = \frac{2r_{xy}}{1+r_{xy}} = \frac{2 \times 0.95}{1+0.95} = 0.97$$

# Appendix 'C'

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## Appendix D

### Row score of the sampled students

#### According to family income

High income	Middle income
1,5,14,37,43,44,48,49,50,52,53,59,63,66,67,68,69,75,85,88,89,90,93,97,99,101,106,114,120,134,135,138,139,140,144,155,156,159,163,164,165,171,172,173,176	2,3,4,6,7,8,9,10,12,13,16,17,18,19,20,21,22,23,24,26,27,28,30,33,39,40,42,47,54,56,57,58,60,61,64,65,78,80,82,83,84,91,100,104,109,115,119,124,125,127,128,130,132,133,136,137,141,143,145,146,147,149,150,151,152,154,158,162,169,174,177,180,182,183,184,186,193,194,195
Low income	
11,15,25,31,32,35,36,29,38,34,41,45,46,51,55,62,70,71,72,73,74,76,77,79,81,86,87,92,94,95,96,98,102,103,105,107,108,110,111,112,113,116,117,118,121,122,123,226,129,131,142,148,157,160,161,166,167,168,170,178,181,185,187,188,189,190,191,192	

#### According to parents time provided

One Hour	Two hour
6,8,9,12,16,17,18,20,21,22,23,24,25,26,27,28,29,31,32,34,35,36,37,38,40,41,44,46,47,55,57,58,61,62,65,67,68,70,71,76,80,86,87,92,94,97,98,102,117,125,126,129,133,142,143,144,145,146,148,149,150,151,157,158,160,161,162,164,166,167,169,170,171,172,174,180,184,185,187,188,189,190,192,	2,3,4,10,11,13,15,19,30,33,39,42,45,49,51,56,59,64,66,72,73,74,77,78,79,83,91,93,100,103,105,108,111,112,113,114,115,116,118,119,120,124,131,139,141,147,152,154,155,163,168,173,176,177,179,183,186,193,194,195
Three or more	
1,5,7,14,43,48,50,52,53,54,60,63,69,75,80,81,82,84,85,88,89,90,95,97,99,101,104,106,107,109,1	

10,121,122,123,124,127,128,130,132,134,135,136,137,138,140,153,156,159,165,175,178,181,182,191

**According to father education**

Education	Literate
1,2,3,4,5,6,7,10,11,12,13,14,15,16,17,18,19,23,25,26,27,28,30,31,32,33,37,41,43,44,48,49,55,52,53,54,57,58,59,60,61,62,63,64,65,66,67,68,,70,72,73,77,78,80,81,82,83,84,87,88,90,93,97,98,100,101,104,106,107,109,110,111,112,117,118,120,122,123,124,125,127,130,133,134,135,137,138,139,140,143,144,147,150,151,152,152,153,155,156,159,160,163,164,165,169,170,171,172,173,174,176,177,180,182,183,184,186,189,191,193	8,9,20,21,24,29,34,35,36,39,40,42,45,46,47,55,56,71,74,77,79,85,86,89,91,92,94,96,99,102,103,105,108,113,115,116,119,121,126,128,129,131,132,136,141,145,146,148,149,154,158,161,162,166,167,168,175,178,179,181,185,187,188,190,192,194,195
Illiterate	
38,76,142,157	

**According to mother education**

Educated	Literate
1,2,3,4,5,10,11,12,13,14,15,19,20,21,22,23,26,27,28,29,41,42,43,44,48,49,50,51,52,53,54,58,59,60,61,62,64,65,67,68,69,70,72,73,77,78,80,81,82,83,86,87,89,92,95,96,98,101,104,106,108,109,110,111,112,114,117,119,120,122,124,127,129,133,134,135,138,139,140,151,152,153,156,159,160,161,165,171,172,174,177,186,189,191,	6,7,8,9,16,17,18,24,30,31,32,33,34,35,37,40,46,47,55,56,57,63,66,71,74,75,79,84,85,88,90,91,93,94,97,99,100,102,103,105,107,113,115,118,121,123,125,126,128,130,131,132,136,137,143,144,146,147,148,149,150,154,155,162,164,166,167,168,169,170,173,175,176,178,179,180,181,182,183,184,185,187,188,189,193,195
Illiterate	
36,38,39,76, 116,141,142,145,157,166,192,194	

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**According to parent visiting school**

Very good	Good
1,2,3,4,5,6,7,8,38,41,55,64,6 9,75,81,86,87,91 92,93,97,99,100,104,105,12 5, 192,193,194,195	9,10,11,12,13,14,15,16,19,20,21,24,25,27,29,30,32,34,35, 36,40,42,45,46,51,56,58,62,66,68 70,71,74,76,78,79,82,83,84,85,88,89,90,95,98 101,102,103,106,107,108,109,110,111,112,114 115,116,118,119,121,122,123,126,127,128,129 130,131,132,133,135,137,138,139,144,145,146 147,152,153,155,156,157,158,159,163,168,172 173,175,176,177,178,182,183,184,185
<b>Low</b>	
17,18,22,23,26,28,31,33,37,39,43,44,47,48,49,50,52,53,54,57,59,60,61,63,65,67, 72,73,77,80,94,96,113,117,120,134,136,140,141,142,143,148,149,150,151,154, 160,161,162,164,165,166s167,169,170,171,174,179,180,181, ,186,188,187,189,190,191,	

## Appendix E

### Interpretation of correlation coefficient

Coefficient( r)	Relationship
0.00 to 0.20	Negligible
0.20 to 0.40	Low
0.40 to 0.60	Moderate
0.60 to 0.80	Substantial
0.80 to 1.00	High to very high

Source: Best J.W. and Kahn, J.V., P.308