

Research maGma

(An International Multidisciplinary Journal)

UGC Approved Journal No: 63465



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An International Multidisciplinary Journal

ISSN- 2456-7078

IMPACT FACTOR- 4.520

VOL-1, ISSUE-10, DEC-2017

TEACHING OF FACTORIZATION USING ALGEBRIC EXPRESSIONS

Dr. N. K. Singh

Associate Professor, RHSPGC, Singramau, Jaunpur

ABSTRACT

Teaching is an interactive process in which active interaction between teacher and student is always required. The teaching of mathematics also involve different methods of teaching at different levels of school education and different branches of mathematics. Factorization is a very important concept which is being taught to students at different levels of study. In the present research the researcher has made an attempt to make the teaching of factorization easy and systematic using the learning of algebraic expression. It was revealed in the study that method of finding, method of expressing, method of grouping and method of using remainder can be used by the teacher to teach the factorization effectively and efficiently using the properties of algebraic expression.

INTRODUCTION:

It seems the algebra is the generalised form of mathematics, whereas arithmetic is the science of number but algebra is expressed with sign and letter for solving problems. The word ALGEBRA has been derived from the arabic word 'al-jabr'al-muqubutab where 'al' means 'the' 'jabar' means 'operation of transferring a quantity from one side of an equation to another side (with the change in its sign)' and 'muqubulah' means 'the process of subtracting similar quantities from both sides of an equation'. In arabic system of mathematics, it was a device of solving the difficult and complicated problems. With the passage of time it has assumed new dimensions and new concepts. It is also considered to be the most difficult and abstract form of all the branches of mathematics. According to researcher 'algebra represents a radical, new and different approach to the study of quantitative relationships, characterised by new symbolism, new concept, a new language, a much higher degree of the fact that are in contrast to arithmetic. Algebra is more concerned with the conscious examination and study of processes than with particular many of its parts for institution and concrete experience'. In algebra students learn to expand the number system of arithmetic so that the four fundamental

operations can be performed. Its knowledge is very useful in the development of manipulative skill, power of generalisation, application of formulae, getting the solution of the problems by equations and the idea of functionality. In teaching and learning its principles are used frequently to return to corresponding situations in arithmetic. Lastly we can say that algebra provides students a new and relevant approach to the study of abstract mathematical relationship through the use of new language and a new symbolism.

We are very much aware of the fact that all types of problems of mathematics cannot be solved by the knowledge of arithmetic only. Without the knowledge of algebra, some of the fundamental operations of mathematics cannot be performed in all the cases. Therefore if we have to learn mathematics, we will have to learn algebra.

ASSUMPTIONS

Teaching of algebra depends on the following assumptions:

1. Teaching of algebra provides an effective way for expressing complicated mathematics of relations.
2. The knowledge of algebra makes it possible to present certain abstract relationships in a new language and new symbols which is more concrete and understandable.
3. Algebra has a close relation with arithmetic and geometry as geometry especially is merely a pictured algebra.

PROCESS OF ALGEBRA

in algebraic method generally two processes are involved:

1. **Symbolisation** :- in this process facts are expressed in the form of symbols. The letters or literal numbers are used to represent unknown quantities.
2. **Generalisation**:- in this process facts are explained with the help of sign or notation according to conditions of the problem. it is generalized form of the facts.

OBJECTIVES

The objective of the present research was to explore the factorization of expressions with the help of algebra in the classroom at secondary level.

METHODOLOGY

In the present study analytical methodology of research was used by the researcher.

ANALYSIS AND INTERPRETATION

Factorization is a process of writing a given number or algebraic expression as a product of two or more numbers. For example: $6=2 \times 3$. It is clear that 2 and 3 are two factors of 6. Similarly $(x^2 - y^2) = (x+y)(x-y)$, therefore $x+y$ and $x-y$ are two factors of $(x^2 - y^2)$. While teaching of the factorization of algebraic expression students should be told to utilize the idea of greatest common factor and some basic identities. Three basic identities are: $(a+b)^2 = a^2 + b^2 + 2ab$, $(a-b)^2 = a^2 + b^2 - 2ab$ and $a^2 - b^2 = (a+b)(a-b)$. Students can get easily the another important identity with the help of basic identities in which multiply is the co-efficient frame of identities whereas other term which is known as sum with product of a and b . for example if $b=x$ then $(a+x)(a+x) = a^2 + x^2 + 2ax$. It is the same if $b=-x$ then value will be $(a-x)^2$.

Researchers had searched some methods of factorization by utilizing the idea of greatest

common factor and basic identities with the help of which we can develop the factorization.

1. Method of Finding

In the factorization process method of finding use the sum and the product of two numbers to find out the factors, we can learn the same with the help of identities. For example: for finding the factors of $x^2+7x+12$, we have two common factors $x+3$ and $x+4$ which is find out as the sum of middle digit and product of sum part separately last digit. Middle digit $7x$ divided in $4x$ and $3x$ the sum of which is $7x$ but product is $12x^2$. Therefore it is clear that method of finding the sum and the product of two numbers are algebraic expression of factorization.

2. Method of Expressing

Researcher has explored for algebraic expression which is applicable to the expression of the type ax^2+bx+c . in this case only a or c is a perfect square but b is an even number. For example: $x^2+10x+16$ have two factors $x+8$ and $x+2$ which is find out by this method is square frame of c .

3. Grouping Method

Some algebraic expressions may be factorize by grouping their terms in such a way that a common factor may be drawn like: $x^2+yz+xy+xz$ is factorize with arranging the term to make the group and taking the common number out for which we get two factors $x+y$ and $x+z$.

4. Method of Using Remainder Theorem

In this method we put such value which make the expression of polynomial=0, and that value will be the factor of such equation. for example: x^3-3x^2+4x-4 has $x-2$ as one of the factor of the expression.

CONCLUSION

Researcher has found that the algebraic expression can be made easy for factorization by using the aforesaid techniques in teaching. Factorization is a process of writing a given number or algebraic expression as the product of two or more of numbers or algebraic expressions. The numbers or algebraic expression that may be multiplied to obtain the given number or algebraic expression are called the factors of the given number or algebraic expression. Thus when an expression is a product of two or more expressions, each of the latter expression is called a factor.

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