British Journal of Global Ecology and Sustainable Development
Volume-13, Feb., 2023
ISSN (E): 2754-9291

EXAMPLE PROBLEMS AND TEACHING METHODS OF SHORT MULTIPLICATION FORMULAS IN SECONDARY SCHOOLS

Erkinova Odinakhan
Andijan State Pedagogical Institute Faculty of exact and Natural Sciences
"Mathematics and informatics 1st Stage Student

Annotation
In this article, problems and examples related to short multiplication formulas are explained to students in an easy way and the importance of solving examples in teaching short multiplication formulas is analyzed.

Keyword: Mathematics, formula, multiplication, students, difference, sum, square, number, cube, proof, calculation, science.

Mathematics is the basis of all exact sciences.
A child who knows this subject well is
intelligent and broad
He grows thoughtful, in any field
It works successfully.
Sh. Mirziyoyev

The efforts made by our respected head of state, the opportunities given to young people, and the radical reforms are very pleasing to the eye. the opportunities that our president is giving to young people, the conditions created for our education, newly constructed buildings, schools, colleges, lyceums and higher education institutions, all of these are just a few of the opportunities that we are focusing on for young people to get quality education As they say, a well-tended, well-planted plant will bear its fruit tomorrow, so the high attention and care given to the young generation in our country will certainly bring the expected results in the future. feel it from the heart We are sorry.

Abu Ali Ibn Sina, one of our great thinkers, who brought the culture of the peoples of Central Asia to the forefront of the world culture in the Middle Ages, in his many mathematical works, there are short multiplication formulas, i.e., multiplication by the square and the cube. he also learned the art of drawing. Short multiplication formulas are mainly learned from 7th grade textbooks. There are many advantages of learning these formulas. The advantage is that the addition or subtraction can be quickly squared or cubed. There are 7 basic formulas. They are as follows

1.The square of the sum $(a+b)^2=a^2+2ab+b^2$
2.The square of the subtraction $(a-b)^2=a^2-2ab+b^2$
3.The cube of the sum $(a+b)^3=a^3+3a^2b+3ab^2+b^3$
4.The cube of the subtraction $(a-b)^3=a^3-3a^2b+3ab^2-b^3$
5.Subtraction of squares $a^2-b^2=(a-b)(a+b)$
6.Sum of cubes $a^3+b^3=(a+b)(a^2-ab+b^2)$
7.subtraction of cubes $a^3-b^3=(a-b)(a^2+ab+b^2)$

1.To calculate the square of the sum, we use the multiplication of the polynomial by the polynomial.

$(a+b)^2=(a+b)(a+b)=a^2+ab+ab+b^2=a^2+2ab+b^2$

That is, when expanding $(a+b)^2$, the square of the first term is twice the product of both terms, and we square the second term. This method is useful for multiplying large numbers. For example

$(82)^2=(80+2)^2=6400+2*2*80+4=6400+324=6724$

2.The square of the difference (1) is also proved in this way, and it also comes in handy when calculating large numbers. For example

$(99)^2=(100-1)^2=10000-2*1*100+1=10000-200+1=9801$

3.Now we will prove the cube of the sum

$(a+b)^3=(a+b)(a+b)(a+b)=(a^2+ab+ab+b^2)(a+b)=a^3+a^2b+2a^2b+2ab^2+ab^2+b^3=a^3+3a^2b+3ab^2+b^3$.

To prove this formula, we spread it out like the formula we proved above and multiply it by each other, then it will be easier to remember.

$(12)^3=(10+2)^3=(10+2)(100+40+4)=(10+2)*144=1440+288=1728$

4.We prove the cube of the difference in the same way as we proved the cube of the sum.

5. To prove the difference of squares, we multiply the sum of two numbers by the difference of two numbers.

$a^2-b^2=(a+b)(a-b)=a^2-ab+ab-b^2=a^2-b^2$

This formula is useful for simplifying the expression. For example

$63*57=(60+3)(60-3)=3600-9=3591$

6.$a^3+b^3=(a+b)(a^2-ab+b^2)$ To prove this formula, we open the brackets on the right side of the equation.

$a^3+b^3=(a+b)(a^2-ab+b^2)$

$a^3+b^3=a^3-a^2b+ab^2+a^2b-a^2b+b^3$

$a^3+b^3=a^3+b^3$ it follows that the right side of the equation is equal to the left side.

7. We consider the cube of the difference as we proved the formula (6).

To sum up, students need to quickly and easily calculate the above-proven examples, only for this method, students should have mastered arithmetic operations well. If students engage in such examples not only in class, but also outside of class, their knowledge of mathematics will increase significantly..

Bibliography

1.7-sinf algebra darsligi.Toshkent-2022
2. M Usmonov Matematika,,Navro'z"Toshkent -2017
3.Abdumalikov Farux Ilxamovich Matematika mustaqil tayyorlanish uchun qo'llanma F Abdumalikov ,,TAFAKKUR"nashriyoti 2018

Journal Zone Publishing, Ilford, United Kingdom