ISSN No:-2456-2165

The Mathematical Research Paper: Formula for Finding Diagonal's Value

Rishikesh Biswas
Prayagraj, India-
Student- Occupation

Abstract:- Some people find geometry branch of maths difficult, so in this paper, we have some easy solutions to finish this problem, the mind-set of the people. This problem should not to be ignored because every branch or every part of maths is important. Everywhere, maths is involved. In this paper, you will know some new formula for finding diagonal's value of a quadrilateral having 90° in its vertices. Intersecting diagonals of a 90° quadrilateral will make the same amount of degrees after intersecting each-other. You will know 5 new formulas in this paper for the following situation.

Keywords- *S= side(s), l=length, b=breadth, diagonal=a straight line segment from one vertex to another but both vertices are not adjacent. Polygon- A shape or a closed curve made up of line segments. Triangle- A polygon having 3 line segments as its sides. Quadrilateral- A polygon having 4 line segments as its sides.*

I. INTRODUCTION

Some people find Geometry branch of maths difficult because of many other things. They learn so many new words, concepts, rules, etc… But, in this paper, we'll find out a new variation for a small part of geometry that is related to polygon. A polygon is a closed curve, made up of only line segments. The polygon having least number of line segments is a triangle, having 3 line segments respectively and a polygon having 4 line segments is a Quadrilateral. So, in this paper, you'll find out a new rule to find out the value of a diagonal of a quadrilateral having 90° in its vertices. It's not about the length, breadth or sides, it is about having 90° in its vertices. Definitely, if there is no complications with length, breadth or side, then this thing is obviously applicable on rectangle and square .But the rule will slightly change for length &breadth to side. In this paper, you'll find out 5 different ways to find the value of a diagonal of a quadrilateral having 90° in its vertices. All of them are different. 1st one is for rectangle and square (Please read instruction for the following rule highlighted in blue). 2nd one is for square. 3rd, 4th and 5th are simplified form of the 2nd formula.

II. EASE OF USE

In this paper we will discuss about the new formula for finding diagonal's value of given Quadrilateral. We will see 5 new formulas for the given situation. It is easier for people of people can use some easier formulas like $\sqrt{2S^2}$. You will see more formulas like this.

III. CONCLUSION

The main motive of the research paper is to introduce people with this new bunch of formulas. The main points of the paper are some examples for formulas. You can try them on some questions which are applicable on it. If they are not, please try- to try and check them again; to use different formula. All of these are proved with some questions in front of you, if there are any mistakes I am sorry and don't forget to inform me about that. In my opinion, I hope that these formulas can help a lot of people who wanted to find something like this. Please don't forget to share your opinion about this with others.

IV. YOU CAN SEE THE FOLLOWING WORK

!!! The length and breadth will definitely change to the side if the quadrilateral's all sides are Equal.

Formulas-

(1) $\sqrt{[\{area \times length\} \div breadth] + breadth^2}$ ***= Diagonal (Rectangle or Square)***

(2) $\sqrt{\{S^3 \div S\} + S^2}$ ***= Diagonal (Square)***

(3) $\sqrt{S^2+S^2}$

(4) $\sqrt{2S^2}$

(5) $\sqrt{S^2 \times 2}$

ISSN No:-2456-2165

!!! <u>Formula no. 4 and 5 are same</u> (5 is simplified explanation in algebra)

For example.

We have a rectangle having-

1. *Area = 6cm²*
2. *Length = 3cm*
3. *Breadth = 2cm*

So, according to the formulae, we should follow like-

(1) √ ([{6 x 3} ÷ 2] + 2²)

= √ ([18 ÷ 2] + 2²)

= √ (9 + 4)

= √13

= 03.605551275463989 = Answer

Now, if we want to find the diagonal's value with this method but in SQUARE. So we will simplyreplace length & breadth into side.
For example,

We have a square having-

1. *Area= 25cm²*
2. *Side=5cm=*

So, we should follow like-

(2) √ ([{25 x 5} ÷ 5] + 5²)

= √ ([125 ÷ 5] +5²)

= √ (25 +25)

= √50

= 07.071067811865475.

OR

(3) √ ({5³÷5} +5²)

=√ ({125 ÷ 5} + 5²)

= √ (25+5²)

=√ (25+25)

=√50

=07.071067811865475.

OR

(4) √ 5²+5²

=√ 25+25
=√50
= 07.07106…

OR

(5) √2 x 5²

=√ 2 x 25
=√ 50
= 07.07106…