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Mathematical Study on Alternating Series in a Regular Hexagon–Proof without Words

Debajyoti Goswami*

Research Scholar, Department of Mathematics, Dr. A.P.J. Abdul Kalam University, Indore

Abstract – The aim of this paper is to introduce a new approach to prove the sum of an alternating series. This is an approach to prove the sum of an alternating series in a regular hexagon.

Keywords: Alternating series, Regular hexagon.

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1. INTRODUCTION:

The proof of the sum of an alternating series in words was introduced a long time ago. Then the study on alternating series to prove without words was started. In 2009 Unal Hasan introduced the proof of the sum of an alternating series without words. In 2012 R B Nelsen introduced the sum of an alternating series in a square. Being inspired from their papers in this paper I shall introduce a new approach to prove the sum of an alternating series. I shall prove the sum of the alternating series in a regular hexagon without words.

2. PRELIMINARIES:

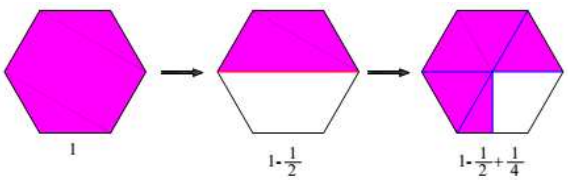
We know that the sum of the alternating series

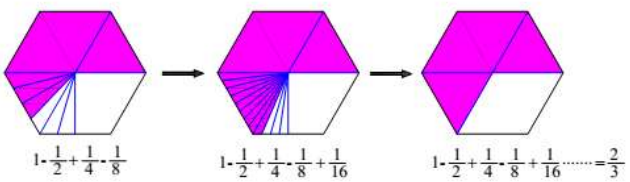
1-(1/2)+(1/4)-(1/8)+(1/16)-…….. is 2/3.

3. NEW APPROACH:

Now we prove the sum of

1-(1/2) + (1/4)-(1/8) + (1/16)-……is 2/3 without words in a regular hexagon.





Thus the sum of the given alternating series is 2/3.

Hence we prove that

1-(1/2)+(1/4)-(1/8)+(1/16)-…….=(2/3) in a regular hexagon without words.

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Corresponding Author

Debajyoti Goswami*

Research Scholar, Department of Mathematics, Dr. A.P.J. Abdul Kalam University, Indore