CLASS: X. MATH ACTIVITY NO.: 5. THE PYTHAGORAS THEOREM.

OBJECTIVE: To verify the Pythagoras Theorem by the method of paper cutting and pasting.

STATEMENT: In a right-angled triangle, the square of the hypotenuse is equal to the sum of the squares of the other two sides.

DESIGN AND OR APPROACH TO THE ACTIVITY: 1) Area of a right triangle and a square. 2) Construction of a right angled triangle and a square. 3) The identity $(a+b)^2 = a^2 + 2ab + b^2$.

PROCEDURE: 1) Draw any right $\triangle ABC$, right-angled at C, on say, a green coloured paper. Let us denote the lengths of sides AB, BC and CA by c, a and b respectively. (Fig (i)). 2) Construct a square of side c units on say, a pink coloured paper. (Fig (ii)). Make 4 exact copies of $\triangle ABC$ (with green coloured paper) and 1 exact replica of the square (with pink coloured paper). 3) Take the above 4 copies of $\triangle ABC$ and the square and paste them all on a plain sheet of paper to form a square. (Fig (iii)).

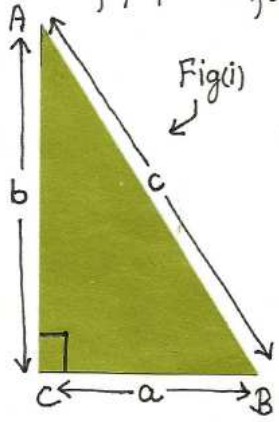

Fig (i)

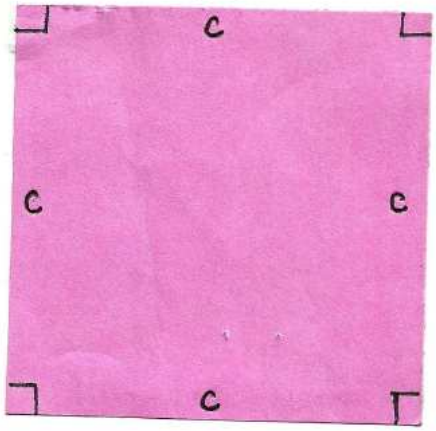

Fig (ii)

Fig (iii) on Page 2.

OBSERVATION: We observe that the side of the square formed is of length $(a+b)$ units. As the square is formed by 4 right triangles and a smaller square, $\therefore$, The area of big square = Area of pink square + Area of 4 right triangles.

$$\Rightarrow (a+b)^2 = c^2 + \cancel{4}^{2} \times \frac{1}{\cancel{2}} ab$$

$$\Rightarrow a^2 + \cancel{2}ab + b^2 = c^2 + \cancel{2}ab$$

$$\Rightarrow a^2 + b^2 = c^2.$$

Hence Verified

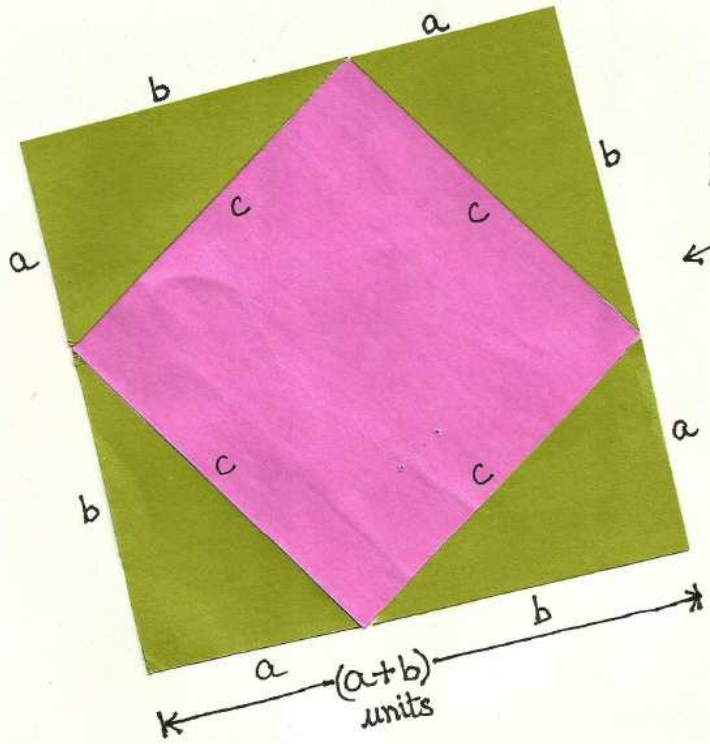

Fig (iii).