

ACTIVITY NO - 6

Subject	Mathematics
Class	X
Chapter/Unit	Triangles
Topic	Pythagoras Theorem
Time	20 minutes
Nature of Activity	Individual

What will I learn (Learning Outcome)?

Verification of Pythagoras Theorem by paper cutting and pasting.

Skills: Applying, Analyzing and Creating

What I have to do?

To verify Pythagoras Theorem by paper cutting and pasting.

What do I require?

Coloured paper, a cardboard, white sheet of paper, a pair of scissors, geometry box

What do I need to know?

Area of Square, Construction of parallel and perpendicular lines

➤ **Teacher's Activity**

Teacher will ask the students about the formula for area of Square, difference between the parallel lines, perpendicular lines and intersecting lines.

How will I proceed?

➤ **Student's Activity**

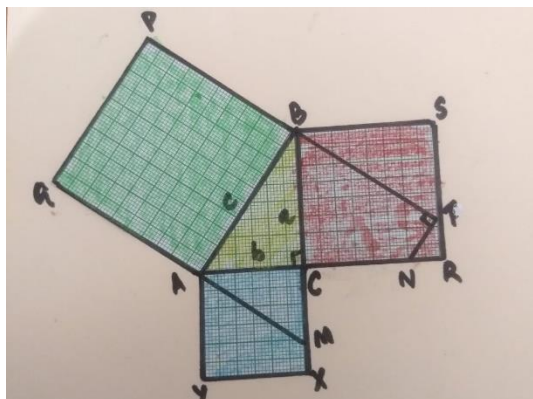
- 1) Paste a white sheet of paper on a cardboard.
- 2) Draw a right triangle ACB of sides $a = 4$ cm, $b = 3$ cm and $c = 5$ cm on a coloured paper and paste it on the white sheet of paper pasted on the cardboard.
- 3) Make an exact replica of the triangle.
- 4) Construct three squares each of side $a = 4$ cm, $b = 3$ cm and $c = 5$ cm along the sides of $\triangle ACB$.
- 5) Label the squares as ABPQ, BCRS and ACXY (as shown in the fig below).
- 6) Produce the side QA of the square ABPQ to meet the side CX at M.
- 7) Similarly, produce PB of the square ABPQ to meet SR of the square BCRS at T. At T, draw $TN \perp CR$ such that N lies on the side CR.
- 8) Cut the squares ABPQ, BCRS and ACXY. Also cut $\triangle ACM$, $\triangle BST$, $\triangle TRN$, quadrilaterals BCNT and AYXM.
- 9) Arrange the three quadrilaterals and two triangles on the square ABPQ as shown below.

What have I observed?

- 1) Area of ABPQ = _____ + _____.
- 2) $c^2 =$ _____ + _____.

What have I learnt?

From the above activity it is verified that in a right triangle, the square of the hypotenuse is equal to _____.



What am I curious to learn?

Repeat the above activity to show that area of an Equilateral triangle described on the hypotenuse (= 13 cm) of a right angles triangle is equal to the sum of the areas of equilateral triangles described on the other two sides (= 5 cm & 12 cm).

Let me evaluate myself

- 1) D and E are the points on the sides CA and CB respectively of $\triangle ABC$ right angled at C. Prove that $AE^2 + BD^2 = AB^2 + DE^2$.

- 2) Prove that in $\triangle ABC$, if AD is perpendicular to BC, then $AB^2 + CD^2 = AC^2 + BD^2$.

- 3) A perpendicular from A on the side BC of a $\triangle ABC$ intersects BC at D such that $DB = 3CD$. Prove that $2AB^2 = 2AC^2 + BC^2$.
