MATHEMATICS PROJECT

CLASS: 8

TOPIC: PROOF OF THE ALGEBRAIC IDENTITY $a^2 - b^2 = (a + b)(a - b)$

OBJECTIVE: To verify the above identity by activity method.

PRE-ACQUIRED KNOWLEDGE:

1. Concept of the area of a square and a rectangle.
2. Calculation of the area of a square and a rectangle.

MATERIALS REQUIRED:

1. Red and blue chart paper
2. Pencil
3. Ruler
4. Pair of Compasses.
5. Paper cutter.
6. Glue stick

PREPARATION:

1. Draw three $8cm \times 8cm$ squares on the red chart paper.
2. Cut out each of them from the red chart paper where you have drawn them with the pencil.
3. Draw two $2\ cm \times 2\ cm$ squares on the blue chart paper.
4. Cut out each of them from the blue chart paper where you have drawn them with the pencil.
5. Paste one red square (ABCD) and one blue square (RBPQ) (figure 1a and figure 1b) on the white page of your project file.
6. In the next white page, paste one red square. On one corner of the red square, paste the second blue square as shown in the figure 2.
7. Cut off one $2\ cm \times 2\ cm$ square portion from one corner of the third red square, as shown in the figure 3.
8. Now draw the line GQ parallel to DC as shown in the figure 4.
9. Cut the portion AGQR.
10. Paste the portion AGQR alongside GDCP with the edge GQ coinciding with the edge PC as shown in the figure 5.

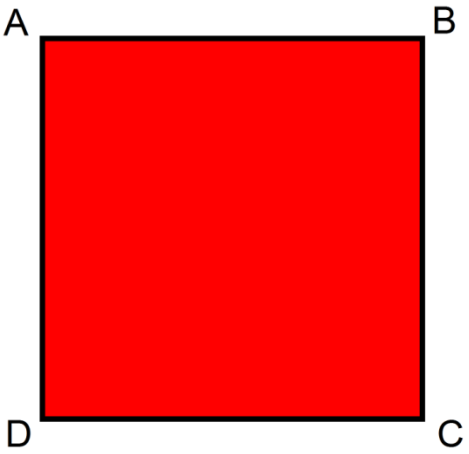

Figure 1a

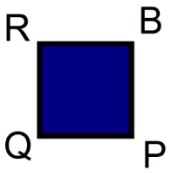

Figure 1b

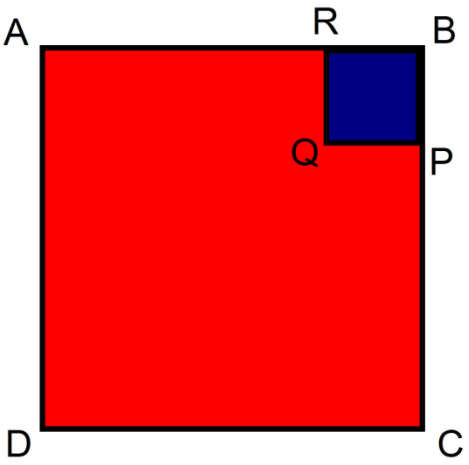

Figure 2

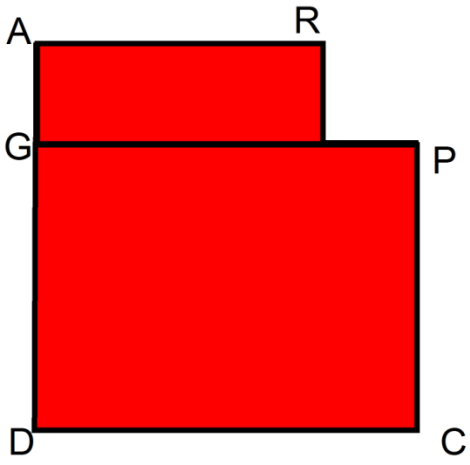

Figure 3

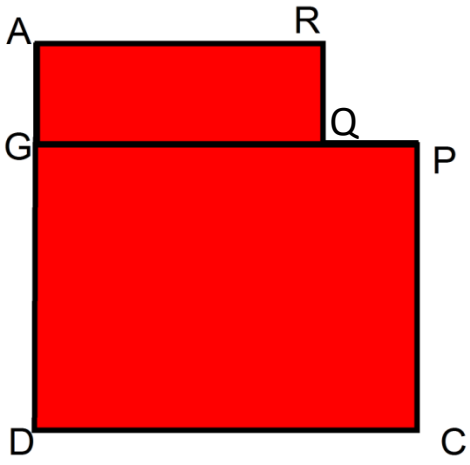

Figure 4

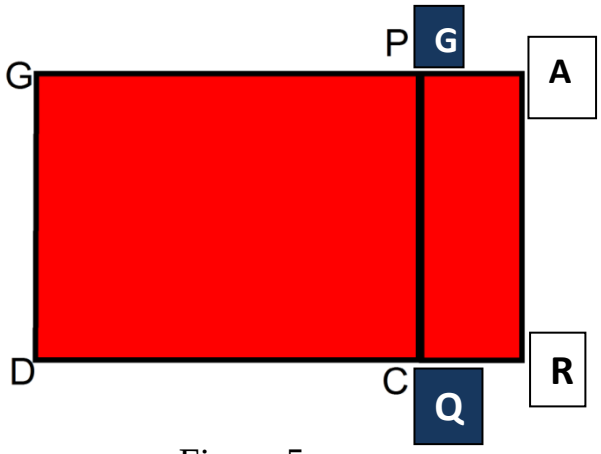

Figure 5

DEMONSTRATION:

1. In figure 1a, AD = 8cm, CD = a = 8cm
2. In figure 1b, RQ = QP = b = 2 cm
3. In figure 2, AR = AB – RB = (a – b) = 8 – 2 = 6cm
4. In figure 4, since the square of 2 cm edge is taken out whose area is $b^2 = 2^2$, hence the net area of ADCPQR = are of the square of 8 cm edge – area of the square of 2 cm edge = $a^2 – b^2 = 8^2 – 2^2 = 60$ cm^2
5. Refer to figure 4, since a 2 cm edge is taken out, hence AG = b = 2 cm
6. Therefore, GD = AD – AG = a – b = 8 – 2 = 6 cm
7. In figure 5, DR = DC + QR = a + b = 8 + 2 = 10 cm
8. Hence, area of the rectangle DRAG = DR × GD = (a + b)(a – b) = (10)(6) = 60 cm^2

LAST DATE OF SUBMISSION OF COMPLETED PROJECT IS 16TH JUNE, 2014