

CLASS: IX. MATH ACTIVITY NO.: 3. AREA OF A TRAPEZIUM.

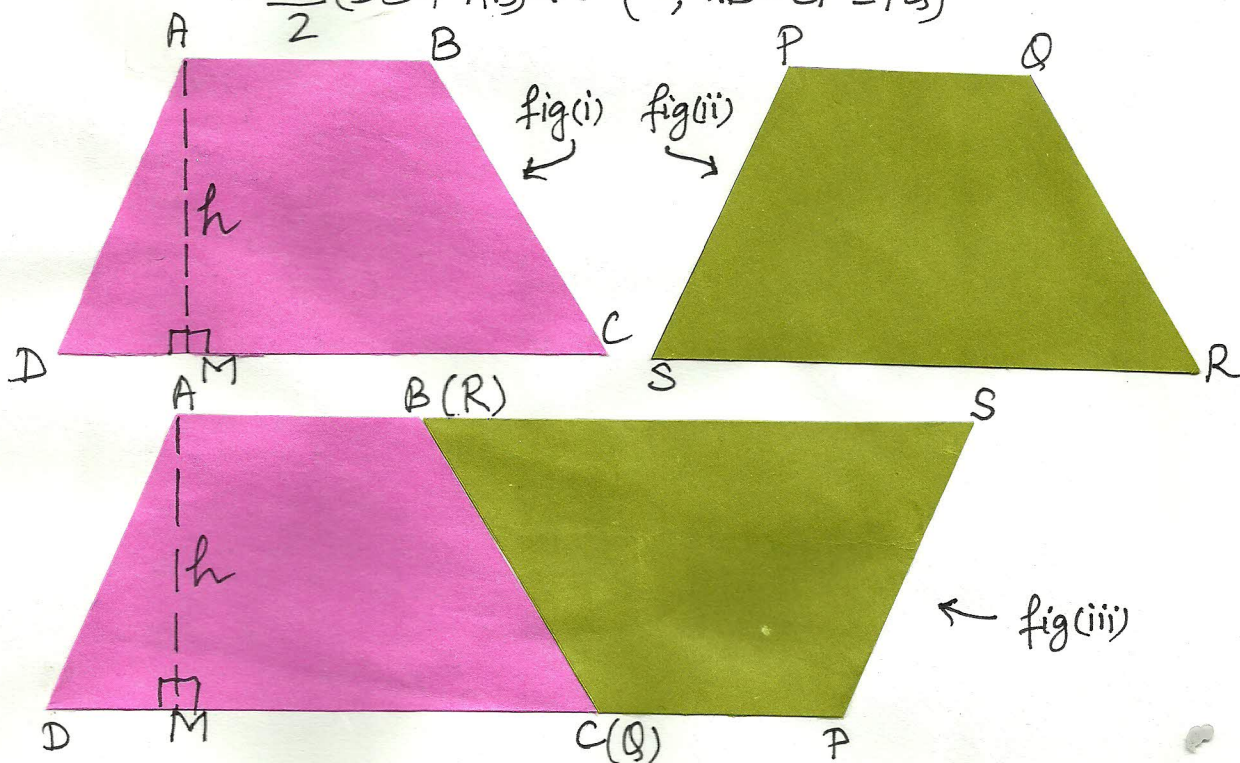
OBJECTIVE: To find a formula for the area of a trapezium.

DESIGN AND OR APPROACH TO THE ACTIVITY: 1) Formula for area of a parallelogram. 2) Definition of a trapezium 3) Altitude of a trapezium.

PROCEDURE: 1) Take two papers each of two different colours. 2) Draw a trapezium ABCD on one of the 4 papers. 3) Cut the 4 papers together alongside the trapezium ABCD to get 4 identical trapeziums. 4) Paste one trapezium of each colour as shown in fig(i) + fig(ii). and name them ABCD and PQRS. 5) Now, paste the second cut of trapezium ABCD and paste the second cut-out of trapezium PQRS in such a way that Q and R coincide with C and B respectively (fig(iii)) 6) Draw altitude AM of the parallelogram ASPD thus obtained and call it h. 7) Area of parallelogram ASPD = DP × h (as area of a parallelogram = Base × Corresponding height. 8) Now, area of trapezium ABCD = $\frac{1}{2} \times$ Area of parallelogram ASPD. 9) Area of trapezium ABCD = $\frac{1}{2} DP \times h$

$$= \frac{1}{2} (DC + CP) \times h$$

$$= \frac{1}{2} (DC + AB) \times h \quad (\because AB = CP = PQ)$$



CONCLUSION :

- 1) $BC = QR$ ($\because$ RQ will coincide with BC)
- 2) $DC + CP = AB + BS$ ($\because$ $DP = AS$ & $DP \parallel AS$)
- 3) $ASPD$ is a parallelogram ($\because$ one pair of opposite sides is equal and parallel)

Thus, Area of a trapezium

$$= \frac{1}{2} \times (\text{sum of parallel sides}) \times \text{Distance between them.}$$