

LESSON PLAN CLASS 9



DLF Public School
THE LEARNING ACADEMY
Managed By Darbari Lal Foundation

Class	Subject	Time Slot	Lesson	Topic P3
IX	MATHS	35 Mins 1 Pd	Heron's formula	Application of Heron's Formula in Finding Areas of Quadrilaterals Exercise 12.2

Expected Learning Outcome: Learners will be able to

- Find the area of quadrilateral by dividing into two different triangles by using Heron's formula
- Find the area of quadrilateral whose sides and one diagonal is given by Heron's formula

Expected skill development:

- Numeracy skills while calculating the area of a triangle and quadrilaterals.
- Problem solving skills while applying Heron's formula

FLOW OF LESSON WITH RESPECT TO TIME (Introduction/warm-up, Content, Think Line, Closure)

Pedagogy	Content
<u>(5 mins) Warm Up</u> <u>Demonstration by facilitator on Black Board</u> Question and Answer Method Discussion Method.	Question for Warm-up Suppose that a farmer has a land to be cultivated and she employs some labourers for this purpose on the terms of wages calculated by area cultivated per square metre. (i) How will she give the wages to the labourers? (ii) Many a time, the fields are in the shape of quadrilaterals. How will you calculate the area of quadrilaterals? Responses: We need to divide the quadrilateral into triangular parts and then use the formula for area of the triangle. Area of triangle = $\sqrt{s(s-a)(s-b)(s-c)}$

	Where a , b and c are sides of triangle and $s = \frac{(a+b+c)}{2}$
<u>(25 mins) Demonstration by Facilitator on Board</u> Question and Answer Method followed by Discussion and Black-Board work	Let us look at this problem: Example 4 : Kamla has a triangular field with sides 240 m, 200 m, 360 m, where she grew wheat. In another triangular field with sides 240 m, 320 m, 400 m adjacent to the previous field, she wanted to grow potatoes and onions (see Fig. 12.11). She divided the field in two parts by joining the mid-point of the longest side to the opposite vertex and grew potatoes in one part and onions in the other part. How much area (in hectares) has been used for wheat, potatoes and onions? (1 hectare = 10000 m²)

	Solution: Let ABC be the field where wheat is grown. Also let ACD be the field which has been divided in two parts by joining C to the mid-point E of AD. For the area of triangle ABC, we have a = 200 m, b = 240 m, c = 360 m Therefore, $s = (200 + 240 + 360) / 2 \text{ m} = 400 \text{ m}$ So, area for growing wheat $= \sqrt{400(400 - 200)(400 - 240)(400 - 360)} \text{ m}^2$ $= \sqrt{400 \times 200 \times 160 \times 40} \text{ m}^2$ $= 16000\sqrt{2} \text{ m}^2 = 1.6 \times \sqrt{2} \text{ hectares}$ $= 2.26 \text{ hectares (nearly)}$ Let us now calculate the area of triangle ACD. Here, we have $s = \frac{240 + 320 + 400}{2} \text{ m} = 480 \text{ m}$. So, area of $\Delta ACD = \sqrt{480(480 - 240)(480 - 320)(480 - 400)} \text{ m}^2$ $= \sqrt{480 \times 240 \times 160 \times 80} \text{ m}^2 = 38400 \text{ m}^2 = 3.84 \text{ hectares}$ We notice that the line segment joining the mid-point E of AD to C divides the triangle ACD in two parts equal in area. TRIGGER: Can you give the reason for this? In fact, they have the bases AE & ED equal and, of course, they have the same height. Therefore, area for growing potatoes = area for growing onions = $(3.84/2) \text{ hectares} = 1.92 \text{ hectares}$.
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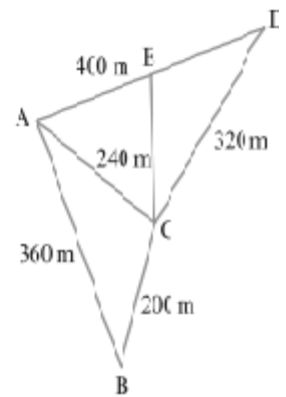


Fig. 12.11

<u>(5 mins) Inclass Exercise: Closure</u> <u>Discussion method</u>	Que3: Radha made a picture of an aeroplane with coloured paper as shown in fig 12.15. Find the total area of the paper used. 1. A park, in the shape of a quadrilateral ABCD, has $\angle C = 90^\circ$, $AB = 9$ m, $BC = 12$ m, $CD = 5$ m and $AD = 8$ m. How much area does it occupy?
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Proposed Questions (must include the questions asked in the classroom and the ones given as class-work in the notebook)

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a) Evaluation/Assessment: Peer discussion will be done. Teacher will assess the children randomly and also through student teacher interaction.

Learners on the way Area of Trapezium with parallel sides a and b, and the distance between two parallel sides as h is ____	Advanced Learners Rhombus with diagonals d_1 and d_2 Area = _____ Perimeter = _____
Materials needed/Resources: Chalk, blackboard, duster, NCERT text book	
Common Misconceptions: None	Addressing the Misconceptions: None

HOME ASSIGNMENTS: Attempt Q 2 ,4 ,5 Of Ex – 12.2 of NCERT Text Book Class 9 in Note book