

# Mathematics

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(OTBA - 2017) (Theme 1: Solving Mystery of messed up fields)  
(Class – IX)

## Question 3:

Description of Nekchand's field:

“In my field when I used to join the opposite corners with ropes, the lengths of the ropes required were equal and the two ropes bisected each other.”

Listening to Nekchand's description about his field, Roshni concluded that his field might be a square or a rectangle. Do you agree with her opinion? Justify.

## Answer 3:

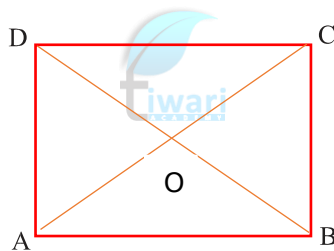
Here,

### Properties of Quadrilateral

Diagonals of square are equal in length and bisect each other.

Diagonals of rectangle are equal in length and bisect each other.

**Given:** A quadrilateral ABCD with  $AC = BD$  in which AC and BD bisect each other at O.



**To find:** Type of quadrilateral ABCD.

**Proof:** In  $\triangle ABO$  and  $\triangle CDO$

$$AO = CO \quad [\text{Given}]$$

$$BO = DO \quad [\text{Given}]$$

$$\angle AOB = \angle DOD \quad [\text{Vertically opposite angles}]$$

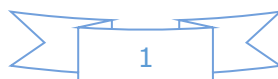
$$\Rightarrow \triangle ABO \cong \triangle CDO \quad [\text{By SAS property}]$$

$$\text{So, } AB = CD \quad [\text{CPCT}]$$

$$\text{Similarly } AD = BC$$

$\Rightarrow$  ABCD is a parallelogram.

[**Theorem:** If opposite sides of a quadrilateral are equal, it is a parallelogram.]



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But  $AC = BD$  [Given]

$\Rightarrow$  ABCD is a rectangle.

[*Theorem: If the diagonals of parallelogram are equal, it is a rectangle.*]

So, we are agree with Roshni's opinion that the field will a rectangle.

