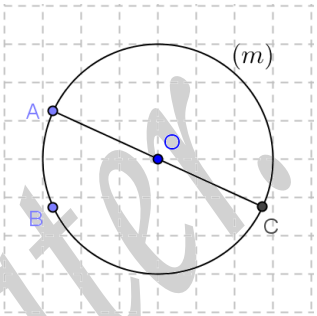
Def: A rectangle is a quadrilateral with three right angles.

Definition of a rectangle



I- Consider the adjacent figure:

1) What does (m) represent?……
2) Find exact measure of $A\hat{B}C = ...$ Specify the tool used.
   ……
3) Trace another diameter $[BD]$.
4) Find the measure of: $B\hat{C}D = ...$; $C\hat{D}A = ...$
5) Deduce the measure of $D\hat{A}B = ...$ (……)
6) What is the nature of quadrilateral $ABCD$? Justify.
   ……

↳ ***Conclusion:*** A rectangle has four …….. angles.

Properties of a rectangle

II- *Rectangles and parallelograms:*

Given the rectangle ***RMNK***

a. Prove that: (RM) is parallel to (KN).
……
……
……
……

b. Prove that: (RK) is parallel to (MN).
……
……
……
……

Therefore, Opposite sides of a rectangle are ……..

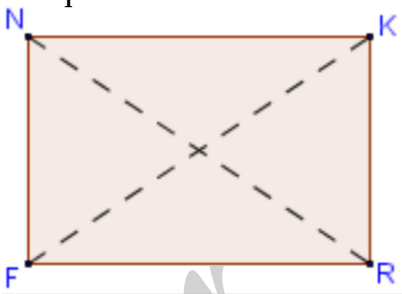
c. Complete the following statements:
Opposite sides of a parallelogram are …… and ……
Opposite angles of a parallelogram and of a ……..are ……..

Conclusion: A rectangle is a ……..

III- *Diagonals of a rectangle:*

Consider the rectangle ***NKRF***

a. Use the triangles *NKR*&*NKF* to prove that [*NR*] and [*KF*] are equal.



……

……

……

……

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b. List the homologous elements:

…… ……

…… ……

Thus, the diagonals [*NR*] and [*KF*] are ……

Conclusion: In a rectangle, the……are……

IV- *Parallelograms with a right angle:* Let ***NOUR*** be a parallelogram such that $R\hat{N}O = 90^\circ$.

Prove that ***NOUR*** is a rectangle:

$R\hat{N}O =$ .....( )

$R\hat{N}O = O\hat{U}R =$ ..... (.....)

$But, R\hat{N}O + N\hat{R}U =$ .....*Since*.....

$Hence, N\hat{R}U =$ ..... (*by substitution*).

$But, N\hat{R}U = N\hat{O}U$ since,.....

$So, R\hat{N}O = N\hat{O}U =$ ..... = ... = ...*by substitution.*

Therefore, the parallelogram *NOUR* is a.....

Conclusion: **:** If a parallelogram has ……., then it is a ……

V- ***Rectangle and axes of symmtry:***

1- Does a parallelogram admit a center of symmetry? ……., specify its position. ……..

2- How are rectangles and parallelograms related? ……...

3- What do you deduce? ……

4- Trace on the opposite figure the perpendicular bisectors of sides:

a. [*RN*]&[*SK*].

b. [*RK*]&[*NS*]

5- What do you notice? ……

6- Where do these perpendicular bisectors intersect? ……

7- What do these lines represent for the given rectangle? Justify.

……

8- Are the diagonals of the rectangle axes of symmetry? Justify.

……

9- Is every line passing through the center of symmetry, is an axis of symmetry?.....

Properties of a rectangle:

1- Angles:……

2- Sides:

i- ……

ii- ……

3- Diagonals:

i- ……

ii- ……

iii- ……

4- Axes of symmetry: ……

How to prove a quadrilateral is a rectangle?

Starting from the:

Definition

- A quadrilateral with four equal angles is a rectangle.

Angles

- A quadrilateral with three right angles is a rectangle.

Sides & angles

- A quadrilateral with its opposite sides equal or (parallel) and one right angle is a rectangle.

Diagonals

- A quadrilateral in which diagonals are equal and bisect each other is a rectangle.

How to prove a parallelogram is a rectangle?

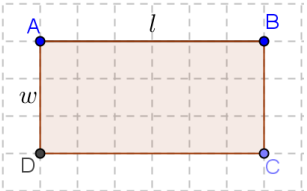
Starting from the

Angles

A parallelogram with one right angle is a rectangle

Diagonals

A parallelogram with equal diagonals is a rectangle.

	*Area is:* $A = length \times width.$
	Perimeter is: $P = sum\ of\ all\ sides.$ $= 2l + 2w$ $= 2(l + w).$