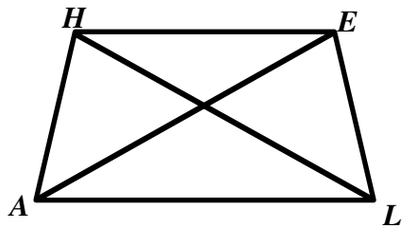
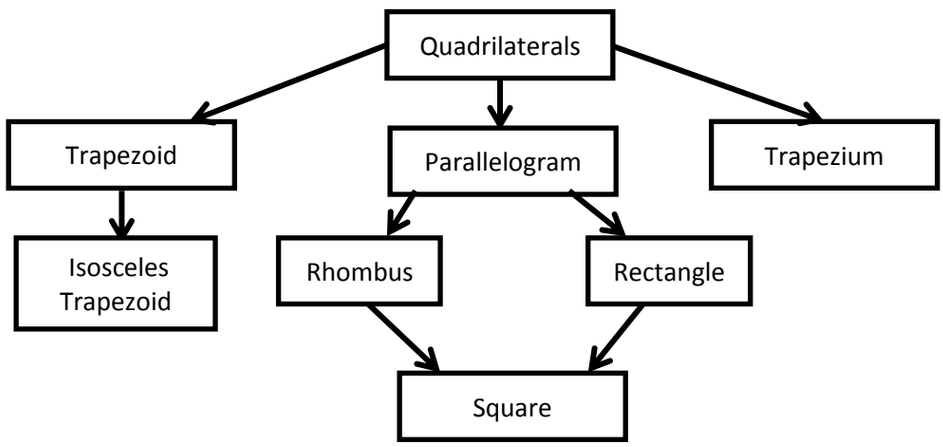
QUADRILATERALS

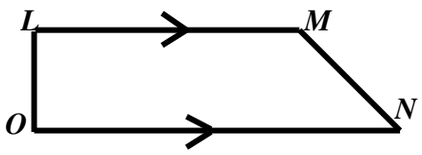
DEFINITION	PICTURE	BASIC INFORMATION
A ***quadrilateral*** is formed by four segments called ***sides*** that intersect at their endpoints, or ***vertices***. Every quadrilateral has four vertices, four sides and four interior angles. Sides that share a common vertex are called ***consecutive sides*** and those that do not are called ***opposite sides***. Segments that join nonconsecutive vertices are called ***diagonals***.		**Name of Quadrilateral:** *Quadrilateral HELA* **Vertices:** H, E, A, L **Sides:** $\overline{HE}, \overline{EL}, \overline{LA}, \overline{AH}$ **Interior Angles:** $\angle H, \angle E, \angle A, \angle L$ **Diagonals:** $\overline{HL}, \overline{AE}$

CLASSIFICATION OF QUADRILATERALS



Trapezoid – a quadrilateral with exactly one pair of parallel sides.
Example:

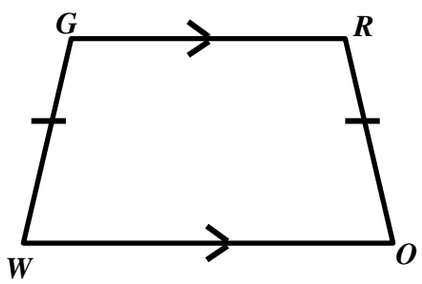
$\overline{LM} \parallel \overline{ON}$
$LMNO \text{ is a trapezoid.}$



Isosceles Trapezoid – a trapezoid whose two sides are congruent. The parallel sides are called the **bases**. The two congruent sides are called the **legs**. The angles formed by a base and a leg are called ***base angles***.

Example:

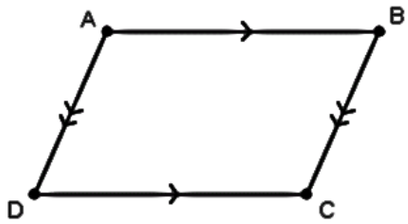
$\overline{GR} \parallel \overline{WO}$
$\overline{GW} \cong \overline{RO}$
$\angle G \text{ and } \angle R$ is a pair of base angles.
$\angle W \text{ and } \angle O$ is another pair of base angles.
$GROW \text{ is an isosceles trapezoid.}$



Parallelogram – A quadrilateral with two pairs of opposite sides that are parallel.

Example:

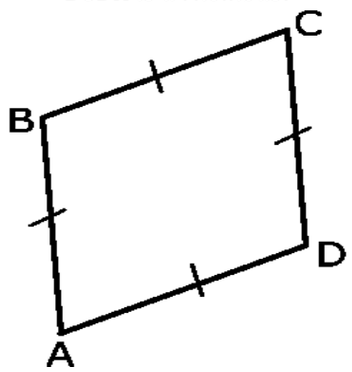
$\overline{AB} \parallel \overline{DC}$
$\overline{AD} \parallel \overline{BC}$
$ABCD \text{ is a parallelogram.}$



Rhombus – a parallelogram with four congruent sides.

Example:

$\overline{AB} \cong \overline{BC} \cong \overline{CD} \cong \overline{AD}$
$BCDA \text{ is a rhombus.}$

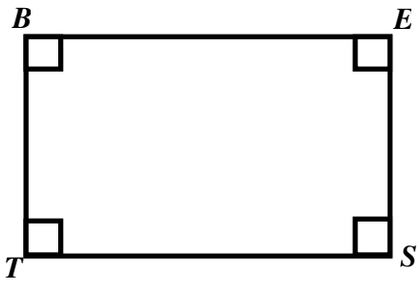


Rectangle – A parallelogram with four right angles.

Example:

$\angle B, \angle E, \angle S, and\ \angle T\ are\ right\ angles$

$BEST\ is\ a\ rectangle.$



Square – A parallelogram with four congruent sides and four right angles.

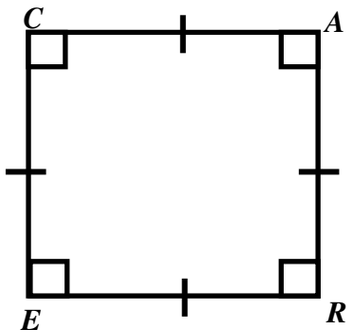
Example:

$\angle C, \angle A, \angle R, and\ \angle E\ are\ right\ angles$

and

$\overline{CA} \cong \overline{AR} \cong \overline{RE} \cong \overline{CE}$

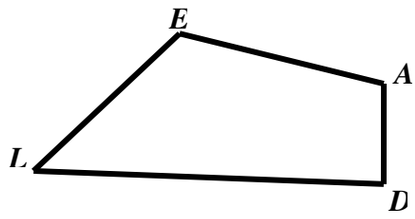
$CARE\ is\ a\ square.$



Trapezium – A quadrilateral with no parallel sides.

Example:

$LEAD\ is\ a\ trapezium.$



PROPERTIES OF QUADRILATERALS

Properties	Trapezium	Parallelogram	Rectangle	Rhombus	Square	Trapezoid	Isosceles Trapezoid
Opposite sides are congruent.		✓	✓	✓	✓		✓ *
All sides are congruent.				✓	✓		
Opposite angles are congruent.		✓	✓	✓	✓		
All angles are congruent.			✓	✓	✓		
Opposite sides are parallel.		✓	✓	✓	✓		✓ *
All angles are right angles.			✓		✓		
The sum of all angles is $360°$.	✓	✓	✓	✓	✓	✓	✓
Consecutive angles are supplementary.		✓	✓	✓	✓		

***One pair only**

Important Things to Remember!

- The sum of the measures of the interior angles of any quadrilateral is **always** equal to $360°$.
- In any parallelogram, the following statements are always true:
  - ✓ Opposite sides are congruent;
  - ✓ Opposite angles are congruent; and
  - ✓ Consecutive angles are supplementary.
- The base angles of an isosceles trapezoid are congruent.