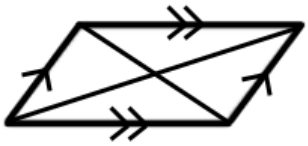
 Name _____

QUADRILATERALS – THEOREM TOOLKIT

Parallelogram



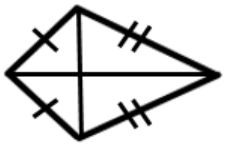
Definition:

2 pair of opposite sides that are parallel

Theorems:

- Opposite sides of a p-gram are congruent.
- Opposite angles of a p-gram are congruent.
- Consecutive angles of a p-gram are supplementary.
- Diagonals of a p-gram bisect each other.

Kite



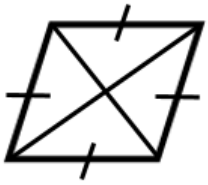
Definition:

2 pair of consecutive sides that are congruent

Theorems:

- Diagonals of a kite are perpendicular.
- One diagonal bisects 2 opposite angles **and** the other diagonal.
- The non-bisected angles of a kite are congruent.
- One diagonal of a kite creates two congruent triangles.
- The other diagonal of a kite creates two isosceles triangles.

Rhombus



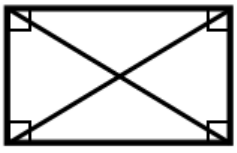
Definition:

All 4 sides are congruent

Theorems:

- A rhombus is a type of p-gram (so all p-gram theorems apply).
- Diagonals of a rhombus are perpendicular.
- Diagonals of a rhombus bisect the angles.
- Diagonals of a rhombus create 4 congruent right triangles.

Rectangle



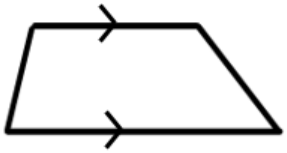
Definition:

All 4 angles are right angles

Theorems:

- A rectangle is a type of p-gram (so all p-gram theorems apply).
- Diagonals of a rectangle are congruent.

Trapezoid



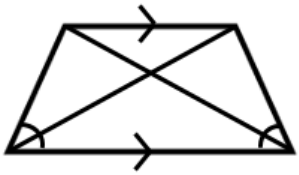
Definition:

At least one pair of opposite sides that are parallel

Theorems:

- No special trapezoid theorems.

Isosceles Trapezoid



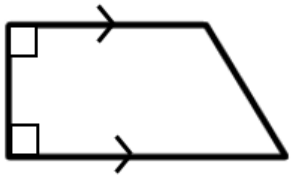
Definition:

One pair of opposite sides that are parallel **and** two pair of base angles that are congruent

Theorems:

- If only one pair of parallel sides, then the **other** pair of sides is congruent.
- Diagonals of an isosceles trapezoid are congruent.

Right Trapezoid



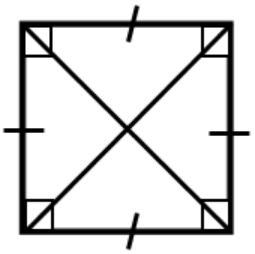
Definition:

One pair of opposite sides that are parallel **and** one pair of consecutive right angles.

Theorems:

- No special right trapezoid theorems.

Square



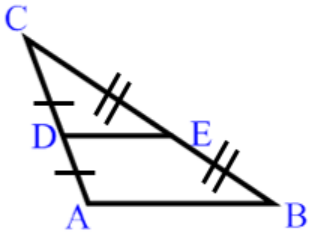
Definition:

All 4 sides are congruent **and** all 4 angles are right angles

Theorems:

- A square is a type of p-gram (so all p-gram theorems apply).
- A square is a type of rhombus (so all rhombus theorems apply).
- A square is a type of rectangle (so all rectangle theorems apply).

Midsegment



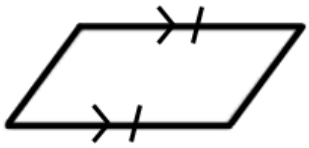
Definition:

Segment joining the midpoints of 2 sides of a triangle – every triangle has 3 midsegments!

Theorems:

- The midsegment = $\frac{1}{2}$ · the 3rd side.
- The 3rd side = 2 · the midsegment.
- The midsegment is parallel to the 3rd side.

Special Parallelogram Theorem



- If one pair of opposite sides of a quadrilateral is parallel **and** congruent, then the quadrilateral is a **P-GRAM**!