Chapter 6 – Quadrilaterals Notes

Angles of Polygons

* Interior Angle Sum Theorem
  + If a convex polygon has *n* sides and S is the sum of the measures of its interior angles, then S=180(n-2)
  + Used to find the measure of each interior angle in a regular polygon
  + Used to find number of sides in a polygon if sum of interior angle measures is known.
* Exterior Angle Theorem
  + Sum of Exterior angles of convex polygon is always 360 degrees

Parallelograms

* Quadrilateral with both pairs of opposite sides parallel
* Opposite sides are congruent
* Opposite angles of a parallelogram are congruent
* Consecutive angles are supplementary
* If parallelogram has one right angle, it has four right angles
* Diagonals of a parallelogram bisect each other and each diagonal separates parallelogram into two congruent triangles

Tests for Parallelograms

* If both pairs of opposite sides of a quadrilateral are congruent, then the quadrilateral is a parallelogram
* If the diagonals of a quadrilateral bisect each other, the quadrilateral is a parallelogram.
* If one pair of opposite sides of a quadrilateral is both parallel and congruent, then it is a parallelogram
* If quadrilateral is graphed on coordinate plane, to find if parallelogram can use:
  + Distance Formula
    - Tests opposite sides for congruence
  + Slope Formula
    - Determines if opposite sides are parallel

Mid Chapter Quiz

Rectangles

* Quadrilateral with 4 right angles
* Both pairs of opposite sides are congruent, so same properties of a parallelogram
* Extra, special properties:
  + Diagonals are congruent
* If quadrilateral is graphed on coordinate plane, to find if parallelogram can use:
  + Distance Formula
    - Calculate measures of diagonals, if congruent than is rectangle
  + Slope Formula
    - Determines if consecutive sides perpendicular, if yes, then rectangle

Rhombi and Squares

* Quadrilateral with all four sides congruent
* Opposite sides congruent, rhombus is a parallelogram
* All properties of parallelograms apply to rhombi
* Special properties of Rhombi
  + Diagonals are perpendicular
  + If the diagonals of parallelogram are perpendicular, then is a rhombus
  + If quad is both a rhombus and rectangle, then it is a square
* Square extremely specialized!

Kites and Trapezoids

* Quadrilateral with exactly one pair of parallel sides
* Parallel sides are called bases, nonparallel sides are called legs
* Base and a leg form a base angle
* If legs congruent, then trapezoid is an isosceles trapezoid
* Both pairs of base angles of an isosceles trapezoid are congruent
* Diagonals of an isosceles trapezoid also congruent
* True for all trapezoids, not just isosceles trapezoids:
  + Segment joining midpoints of legs of a trapezoid is median
  + Median of a trapezoid is parallel to bases and its measure is ½ sum of the measures of bases