Homework #7 - Due Thursday, 14 January

Ch 7 Review, pp. 292-295 **#1-53**

Test #3 - Thurs, 14 Jan

Emphasis on Ch 7 except Midsegment Theorem, plus review

Theorem 17: Equal corresponding angles mean that lines are parallel.
Corollary 1: Equal alternate interior angles mean that lines are parallel.
Corollary 2: Supplementary interior angles on the same side of a transversal mean that lines are parallel.
Corollary 3: In a plane, two lines perpendicular to a third line are parallel.

The Parallel Postulate – Through a point not on a line, there is exactly one line parallel to the given line.
Theorem 18: In a plane, two lines parallel to a third line are parallel to each other.

Theorem 19: Parallel lines form equal corresponding angles.
Corollary 1: Parallel lines form equal alternate interior angles.
Corollary 2: Parallel lines form supplementary interior angles on the same side of a transversal.
Corollary 3: In a plane, a line perpendicular to one of two parallel lines is also perpendicular to the other.

Theorem 20: The Triangle Sum Theorem – The sum of the angles of a triangle is 180°.
Corollary 1: If two angles of one triangle are equal to two angles of another triangle, the third angles are equal.
Corollary 2: The acute angles of a right triangle are complementary.
Corollary 3: Each angle of an equilateral triangle is 60°.

Theorem 21: An exterior angle of a triangle is equal to the sum of the remote interior angles.

Theorem 22: The AAS Theorem – If two angles and the side opposite one of them in one triangle are equal to the corresponding parts of another triangle, the triangles are congruent.

Theorem 23: The HL Theorem – If the hypotenuse and a leg of one right triangle are equal to the corresponding parts of another right triangle, the triangles are congruent.

SSS, SAS, AAS, ASA, HL

Def: A diagonal of a polygon is a line segment that connects any two nonconsecutive vertices.

Theorem 24: The sum of the angles of a quadrilateral is 360° .

Def: A rectangle is a quadrilateral each of whose angles is a right angle.

Corollary to Theorem 24: A quadrilateral is equiangular iff it is a rectangle.

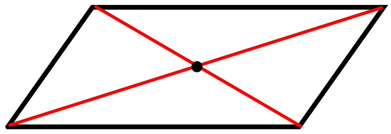
In general, if a polygon has n sides, in terms of n,
- n-3 diagonals can be drawn from one vertex
- these diagonals form n-2 triangles
- the sum of the angles of an n-gon is (n-2)*180°
- If the n-gon is equiangular, each angle measures (n-2)*180°/n

Def: A parallelogram is a quadrilateral whose opposite sides are parallel.

A figure has point symmetry if it looks exactly the same when it is rotated about a point.

Def: Two points are symmetric with respect to a point iff it is the midpoint of the line segment joining them.

Parallelograms have point symmetry about the point in which their diagonals intersect.



Theorem 25: The opposite sides and angles of a parallelogram are equal.
Theorem 26: The diagonals of a parallelogram bisect each other.
Theorem 27: A quadrilateral is a parallelogram, if its opposite sides are equal.
Theorem 28: A quadrilateral is a parallelogram if its opposite angles are equal.
Theorem 29: A quadrilateral is a parallelogram if two opposite sides are both parallel and equal.

Theorem 30: A quadrilateral is a parallelogram if its diagonals bisect each other.

7.4 – Rectangles, Rhombuses, and Squares

Def: A square is a quadrilateral all of whose sides and angles are equal.

Every square is a rhombus.

Def: A rhombus is a quadrilateral all of whose sides are equal.

Theorem 31: All rectangles are parallelograms.

Theorem 32: All rhombuses are parallelograms.

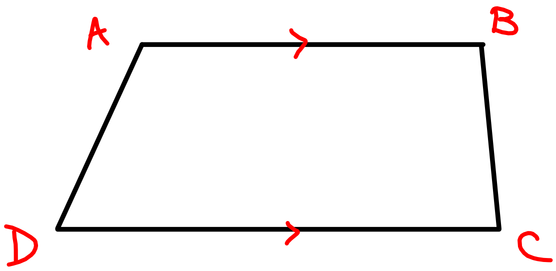
Theorem 33: The diagonals of a rectangle are equal.

Theorem 34: The diagonals of a rhombus are perpendicular.

7.5 – Trapezoids

Def: A trapezoid is a quadrilateral that has exactly one pair of parallel sides.

The parallel sides are called the bases of the trapezoid, and the non-parallel sides are called its legs. The pairs of angles that include each base are called base angles.



In this trapezoid:

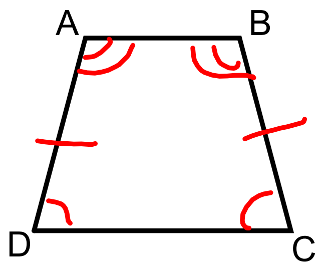
Sides AB and DC are bases.

Sides AD and BC are legs.

Angles A and B are one pair of base angles.

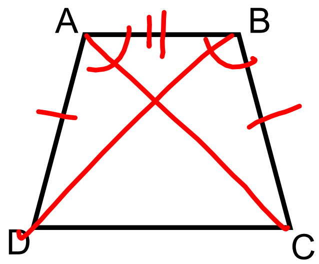
Angles D and C are another pair of base angles.

Def: An isosceles trapezoid is a trapezoid whose legs are equal.



Theorem 35: The base angles of an isosceles trapezoid are equal.
Given: ABCD is an isosceles trapezoid with bases AB and DC.
Prove: ∠A=∠B and ∠D=∠C

Theorem 36 : The diagonals of an isosceles trapezoid are equal.
Given: ABCD is an isosceles trapezoid with bases AB and DC.
Prove: DB=CA.



If a quadrilateral is a trapezoid, then its diagonals cannot bisect each other.

Given: ABCD is a trapezoid
Prove: AC and DB do not bisect each other.