Cheat Sheet for Geometry Midterm
(only includes official postulates, theorems, corollaries and formulas)

**points, lines, planes, intersections,**

- Through any two points there is exactly one line.
- Through any three noncollinear points there is exactly one plane containing them.
- If two planes intersect, then they intersect in exactly one line.
- If two lines intersect, then they intersect in exactly one point.

**linear pairs, supplements, complements, vertical angles, right angles**

- If two angles form a linear pair, then they are supplementary.
- The sum of the measures of the angles of a linear pair is 180.
- If two angles are supplementary to the same angle or to two congruent angles, then the two angles are congruent.
- If two angles are complementary to the same angle or to two congruent angles, then the two angles are congruent.
- All right angles are congruent.
- Vertical angles are congruent.

**parallel lines, angles formed by parallel lines and transversals, perpendicular lines**

- If two parallel lines are cut by a transversal, then corresponding angles are congruent.
- If two parallel lines are cut by a transversal, then alternate interior angles are congruent.
- If two parallel lines are cut by a transversal, then alternate exterior angles are congruent.
- If two parallel lines are cut by a transversal, then same side interior angles are supplementary.
- If two lines are cut by a transversal so that corresponding angles are congruent, then the lines are parallel.
- If two lines are cut by a transversal so that alternate interior angles are congruent, then the lines are parallel.

(over)
• If two lines are cut by a transversal so that alternate exterior angles are congruent, then the lines are parallel.

• If two lines are cut by a transversal so that same side interior angles are supplementary, then the lines are parallel.

angles of triangles, exterior angles, remote interior angles

• The sum of the measures of the interior angles of a triangle is 180.

• The acute angles of a right triangle are complementary.

• The measure of each angle of an equilateral triangle is 60.

• The measure of one exterior angle of a triangle is equal to the sum of the measures of its remote interior angles.

• If two angles of one triangle are congruent to two angles of another triangle, then the third angles are congruent.

congruent triangles, isosceles triangles

• SAS Postulate

• ASA Postulate

• SSS Postulate

• AAS Theorem

• HL Theorem

• CPCTC

• If two sides of a triangle are congruent, then the angles opposite these sides are congruent.

• If two angles of a triangle are congruent, then the sides opposite these angles are congruent.

• If three sides of a triangle are congruent, then the three angles are also congruent.

• If three angles of a triangle are congruent, then the three sides are also congruent.
perpendicular bisectors, angle bisectors, equidistant, median of a triangle, altitude of a triangle, midsegment

• If a point is on the perpendicular bisector of a segment, then it is equidistant from the endpoints of the segment.

• If a point is equidistant from the endpoints of a segment, then it is on the perpendicular bisector of the segment.

• If a point is on the bisector of an angle, then it is equidistant from the sides of the angle.

• If a point in the interior of an angle is equidistant from the sides of the angle, then it is on the bisector of the angle.

• The circumcenter of a triangle is equidistant from the vertices of the triangle.

• The incenter of a triangle is equidistant from the sides of the triangle.

• The centroid of a triangle is located 2/3 of the distance from each vertex to the midpoint of the opposite side.

• The midsegment of a triangle is parallel to the third side of the triangle and its length is half the length of the third side.

Formulas

• Area of a rectangle = lw or bh

• Area of a square = s²

• Area of a triangle = \frac{1}{2} bh

• Circumference of a circle = d\pi \text{ or } 2\pi r

• Area of a circle = \pi r²

• Midpoint Formula: The midpoint M pf \overline{AB} with endpoints A(x₁, y₁) and B(x₂, y₂) is:
  \[ M(\frac{x₁ + x₂}{2}, \frac{y₁ + y₂}{2}) \]

• Distance Formula: In a coordinate plane, the distance between two points (x₁, y₁) and (x₂, y₂) is:  
  \[ d = \sqrt{(x₂ - x₁)^2 + (y₂ - y₁)^2} \]

• Slope Formula: \[ m = \frac{y₂ - y₁}{x₂ - x₁} \]

• Slope-intercept form: \[ y = mx + b \]

• Point-slope form: \[ y - y₁ = m(x - x₁) \]