**IDX G9 MATH S+ STUDY GUIDE ISSUE 2**

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**(p.s. Th stands for Theorem)**

**1.5 Measuring Segments**

**1.6 Measuring Angles**

**2.4 Reasoning in Algebra**

**2.5 Proving Angles Congurent**

- *Th 2-1 Vertical Angles Theorem*: Vertical angles are congurent.

- *Th 2-2 Congurent Supplements Theorem*: If 2 angles are supplements (180 degree) of the **same** angle (or of **congruent** angles), then the 2 angles are congruent.

- *Th 2-3 Congurent Complements Theorem*: If 2 angles are complements (90 degree) of the **same** angle (or of **congruent** angles), then the 2 angles are congruent.

- *Th 2-4 All right triangles are congruent*

- *Th 2-5 If 2 angles are congruent and supplementary, then each is a right*  *angle.*

**Chapter 3 Parallel and Perpendicular Lines**

**3.1 Properties of Parallel Lines**

- *Postulate 3-1 Corresponding Angles Postulate*: If a transversal intersects 2 parallel lines, then corresponding angles are **congruent**.

- *Th 3-1 Alternate Interior Angles Theorem*: If a transversal intersects 2 parallel lines, then alternate interior angles are **congruent**.

- *Th 3-2 Same-Side Interior Angles Theorem*: If a transversal intersects 2 parallel lines, then **same-side interior angles are supplementary**.

- *Th 3-3 Alternate Exterior Theorem*: If a transversal intersects 2 parallel lines, then alternate exterior angles are **congruent**.

- *Th 3-4 Same-Side Exterior Angles Theorem*: If a transversal intersects 2 parallel lines, then **same-side exterior angles are supplementary**.

**3.2** **Proving lines parallel**

- *Postulate 3-2 Converse of Corresponding Angles Postulate*: If 2 lines and a transversal form **corresponding angles that are congruent**, then the 2 lines are parallel.

- *Th 3-5 Converse of Alternate Interior Angles Theorem*: If 2 lines and a transversal form **alternate interior angles that are congruent**, then the 2 lines are parallel.

- *Th 3-6 Converse of Same-Side Interior Angles Theorem*: If 2 lines and a transversal form **same-side interior angles that are supplementary**, then the 2 lines are parallel.

- *Th 3-7 Converse of Alternate Exterior Angles Theorem*: If 2 lines and a transversal form **alternate exterior angles that are congruent**, then the 2 lines are parallel.

- *Th 3-8 Converse of Same-Side Exterior Angles Theorem*: If 2 lines and a transversal form **same-side exterior angles that are supplementary**, then the 2 lines are parallel.

**3.3 Parallel and Perpendicular Lines**

- *Th 3-9*: If 2 lines are parallel to the same line, then they are parallel to each other.

- *Th 3-10*: **In a plane**, if 2 lines are perpendicular to the same line, then they are parallel to each other.

- *Th 3-11*: **In a plane**, if a line is perpendicular to 1 of 2 parallel lines, the it is alos perpendicular to each other.

**3.4 Parallel Lines and the Triangle Angle Sum Theorem**

- *Th 3-12 Triangle Angle-Sum Theorem*: The sum of the measures of the angles of a triangle is 180.

- *Th 3-13 Triangle Exterior Angle Theorem*: The measure of each exterior angle of a triangle equals the sum of the measures of its 2 remote interior angles.

- An exterior angle is an angle formed by a side and an extension of an adjacent side.

- For each exterior angle of a triangle, the 2 nonadjacent interiors angles are its remote interior angles.

- Classify a triangle by angles:

- Equiangular: all angles congruent

- Acute: all angles acute

- Right: one right angle

- Obtuse: one obtuse angle

- Classify a triangle by sides:

- Equilateral: all sides congruent

- Isosceles: **at least** 2 sides congruent

- Scalene: no sides congruent

- Steps to classify triangle:

1. Valid triangle: sum of 2 shortest sides should be greater than the remaining side (longest side)  
   2) Acute triangle: a² + b² > c²

Right triangle: a² + b² = c²

Obtuse triangle: a² + b² < c²

**Chapter 4 Congruent Triangles**

**4.1 Congruent Figures**

- *Th 4-1*:If 2 angles of one triangle are congruent to 2 sides of another triangle, then the 3rd angles are congruent.

**4.2 Triangle Congruence by SSS and SAS**

- *Postulate 4-1: (SSS)* If the 3 sides of a triangle are congruent to the sides of another triangle, then the 2 triangles are congruent.

- *Postulate 4-2: (SAS)* If 2 pairs of sides are congruent and the included angles are also congruent, then the 2 triangles are congruent.

- Has to be included angle of 2 sides, no “SSA”

**4.3 Triangle Congruence by ASA and AAS**

- *Postulate 4-3: (ASA)* If the 2 pairs of angles are congruent and the included sides are congruent, then the 2 triangles are congruent.

- *Th 4-2: (AAS)* If 2 pairs of angles are congruent and a nonincluded side congruent to the correspnding nonincluded side of the other triangle, then the 2 triangles are congruent.

**4.4 Using Congruent Triangles: CPCTC**

- *CPCTC: (Corresponding parts of congruent triangles are congruent)* If 2 triangles are proven congruent by 3 congruences, then the other 3 congruences hold true too.