Modules 1-4 Definitions, Postulates, Theorems [[[STUDY GUIDE]]]

1. **Undefined terms of Geometry:**
   * Point
   * Line
   * Plane
2. **Some definitions:**

* **Angle**: Two rays with a common endpoint
  + Acute: between 0 and 90◦.
  + Obtuse: between 90 and 180◦
  + Straight: exactly 180◦
  + Right: exactly 90◦
* **Angle Bisector**: Ray, line or segment which divides an angle into two congruent angles.
* **Segment Bisector:** Ray, line or segment which divides a segment into two congruent segments.
* **Perpendicular Bisector:** Ray, line or segment perpendicular to a segment and which divides the segments into two congruent segments.
* **Midpoint**: The point ON a segment that divides it into two congruent segments.
* **Collinear Points**: Points that lie on the same line.
* **Coplanar Points**: Points that lie in the same plane.
* **Complementary Angles**: Angles whose sum of measures is 90◦.
* **Supplementary Angles:** Angles whose sum of measures is 180◦
* **Parallel Lines**: Coplanar lines which do not intersect.
* **Perpendicular Lines**: Intersecting lines forming 90◦angles.

1. **Transformations:**

* Translation (Slide) – Rigid Transformation – Isometry- Preserves size and shape.
* Rotations (Turn) – Rigid Transformation – Isometry- Preserves size and shape.
* Reflection (Flip) – Rigid Transformation – Isometry- Preserves size and shape.
* Dilations – Does not preserve size. All coordinates multiplied by the same factor – (scalar multiplication).
* Distortion – Does not preserve size. The coordinated multiplied by different factors.
* Memorize/LEARN **“transformations rule”** sheet.

1. **Symmetry:**
   * Rotational symmetry
   * Line symmetry [[reflectional symmetry]]
2. **Angle Addition Postulate: See Pg. 22**
3. **Properties of Equalities: See Pg. 46**
4. **Postulates about lines and planes. See Pg. 50**
5. **Tools of construction:**
   * Compass
   * Straightedge
     + Make sure you know the following constructions:
       - Copy a segment
       - Copy an angle
       - Bisect an angle
       - Parallel line **\*\***
       - Perpendicular Bisector of a segment
       - Perpendicular line from a point **OFF** the line
       - Perpendicular line from a point **ON** the line.
6. **Slope of a line:** m =
7. **Midpoint of a segment:**
8. **Distance between two points:** d =
9. **Parallel Slope Property:** In a coordinate plane if two lines are parallel, they have the same slope.
10. **Perpendicular Slope Property**: In a coordinate plane, if two lines are perpendicular, their slopes are the opposite reciprocals of each other.
11. **Definition of Linear Pair**: A pair of adjacent angles whose non common sides are opposite rays. **(form a line)**
12. **Linear Pair Theorem:** If two angles form a Linear Pair, then they are supplementary.
13. **Vertical Angles Theorem:** If two angles are vertical angles, then they are congruent.
14. **Corresponding Angles Conjecture (CA):** If two parallel lines are cut by a transversal, then corresponding angles are congruent.
15. **Alternate Interior Angles Theorem (AIA):** If two parallel lines are cut by a transversal, then alternate interior angles are congruent.
16. **Alternate** **Exterior Angles Conjecture (AEA Conjecture):** If two parallel lines are cut by a transversal, then alternate exterior angles are congruent.
17. **Same Side Interior Angles Theorem(SSIA):** If two parallel lines are cut by a transversal, then same side interior angles are supplementary.
18. **The Converse of the CA Theorem:** If two lines are cut by a transversal and Corresponding Angles are congruent, then the lines are parallel.
19. **The Converse of the AIA Theorem:** If two lines are cut by a transversal and Alternate Interior Angles are congruent, then the lines are parallel.
20. **The Converse of the AEA Theorem:** If two lines are cut by a transversal and Alternate Exterior Angles are congruent, then the lines are parallel.
21. **The Converse of the SSIS Theorem:** If two lines are cut by a transversal and Same Side Interior Angles are supplementary, then the lines are parallel.
22. **Parallel Line Postulate:** Through a point ***P*** Not on a line *l,* there is exactlyone line parallel to *l*. [[Parallel line construction**\*\***]]
23. **Slope-Intercept form of a linear equation:** y= mx + b
24. **Point-Slope form of a linear equation:**
25. **Perpendicular Bisector Theorem:** If a point is on the perpendicular bisector of a segment, then it is equidistant from the endpoints of the segment.
26. **Converse of the Perpendicular Bisector Theorem:** If a point is equidistant from the endpoints of the segment, then it lies on the perpendicular bisector of a segment.

