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 = $\frac{y\_{2-}y\_{1}}{x\_{2}-x\_{1}}$
7. **Midpoint of a segment:** $\left(\frac{x\_{1+}x\_{2}}{2},\frac{y\_{1+}y\_{2}}{2} \right)$
8. **Distance between two points:** d = $\sqrt{\left(x\_{2}-x\_{1}\right)^{2}+\left(y\_{2}-y\_{1}\right)^{2}}$
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:** $ y-y\_{1}=m\left(x-x\_{1}\right)$
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.

