

Geometry – 8th grade

1. Introduction to Geometry

- . Quick review of points, lines, and planes.**
- . Geometry's real-world applications in design, architecture, and engineering.**

2. Polygons and Angles

- . Interior and Exterior Angles: Sum of interior angles of an n -sided polygon = $(n - 2) \times 180^\circ$, exterior angles = 360° .**
- . Diagonals: Formula for number of diagonals = $n(n-3)/2$.**
- . Angle Bisectors: Properties and constructions.**

3. Perimeter, Area, and Surface Area

- . Surface Area of 3D Figures: Pyramids, spheres, composite solids.**
- . Sector Area of Circles: Formula for the area of a sector:**
$$\text{Area} = \frac{\theta}{360^\circ} \times \pi r^2$$

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4. 3D Geometry and Volume

- . Volume: Cones, spheres, and composite solids.**
- . Revolution of Shapes: Solving problems involving solids created by rotating shapes.**

5. Pythagorean Theorem & Extensions

- . Proof and Applications: Derivation, Pythagorean triples, and 3D applications.**
- . Distance Formula: Use in coordinate geometry.**

6. Transformations & Symmetry

- . Reflections, Rotations, Translations: Using matrices.**
- . Dilations & Tessellations: Exploring similarity and real-world applications.**

7. Trigonometry Basics

- . Trigonometric Ratios: Sine, Cosine, Tangent for right triangles.**

- . Real-World Applications: Solving problems in navigation, construction.**

8. Coordinate Geometry

- . Midpoint and Slope: Formulae for lines, intersections, and circle equations.**

9. Summary and Review

- . Quick Recap: Key concepts covered.**
- . Q&A: Address questions and challenge problems.**
- . Homework: Practice on perimeter, area, volume, transformations, and trigonometry.**

10. Assessment

- . In-Class Quiz: Advanced questions on all covered topics.**
- . Homework: Problems on advanced topics like 3D geometry, trigonometry, and coordinate geometry.**