Algebra – 8th grade

1. Introduction to Algebra

- **Definition of Algebra: The study of mathematical symbols and rules for manipulating them.**
- **Importance of Algebra: Used in everyday life, science, technology, and engineering.**
- **Key Concepts: Variables, constants, expressions, and equations.**

2. Basic Algebraic Operations

- **Addition & Subtraction**
  - **Example: 3 + 4 = ?**
- **Multiplication & Distribution**
  - **Example: Simplify 5(x + 2)**
- **Solving Equations**
  - **Example: Solve for x: 4x = 16**
- **Expanding Expressions**
  - **Example: (x + 3)(x + 1)**

3. Understanding Slopes & Graphing

- **Slope of a Line: y = mx + b (where m is the slope and b is the y-intercept)**
  - **Example: What is the slope of y = 2x + 3?**
- **Finding the Slope Between Two Points**
  - **Example: Find the slope of the line passing through (1,3) and (4,7)**
- **Graphing Equations**
  - **Converting equations into slope-intercept form.**

4. Intermediate Algebra Concepts

- **Factorization: Breaking down expressions into simpler terms.**
  - **Example: Factorize x^2 - 9**
- **Exponent Rules: Understanding powers and exponents.**
  - **Example: Simplify (x^2 * x^3)**
- **Solving Multi-Step Equations**
  - **Example: Solve 2x + 5 = 11**

5. Advanced Algebra Topics

- **Quadratic Equations: Understanding and solving x^2 - 8x + 15 = 0**

- **Matrices and Determinants: Introduction to simple matrices.**
- **Finding Intersections of Lines**
    - **Example: Find the intersection of y = x + 4 and y = -x + 6.**

6. Summary and Review

- **Recap of key concepts.**
- **Q&A session.**
- **Homework assignment: Practice problems covering basic to advanced algebra.**

Assessment & Homework

In-Class Quiz: Covering basic, medium, and advanced problems similar to the ones provided. Homework: Solve 10 practice problems involving algebraic expressions, equations, slopes, and quadratic equations.