Algebra – 9th grade

1. Advanced Algebraic Concepts

- **Polynomials: Operations (addition, subtraction, multiplication, division) and factoring.**
  - **Example: Simplify (x2+2x−3)+(x2−4)(x^2 + 2x - 3) + (x^2 - 4)(x2+2x−3)+(x2−4).**
  - **Factor: x2−9x^2 - 9x2−9.**
- **Rational Expressions: Simplifying and solving.**
  - **Example: Solve 2x+3x−5=4\frac{2x + 3}{x - 5} = 4x−52x+3=4.**

2. Advanced Equations

- **Quadratics: Using the quadratic formula and completing the square.**
  - **Example: Solve x2+6x−7=0x^2 + 6x - 7 = 0x2+6x−7=0.**
- **Systems of Equations: Solving using substitution or elimination.**
  - **Example: Solve 2x+3y=72x + 3y = 72x+3y=7 and x−y=1x - y = 1x−y=1.**
- **Absolute Value: Solving absolute value equations and inequalities.**
  - **Example: Solve |2x−3|=5|2x - 3| = 5|2x−3|=5.**

3. Exponents and Radicals

- **Exponent Rules: Simplifying expressions with exponents.**

- Example: Simplify (x3)(x4)(x^3)(x^4)(x3)(x4).

4. Advanced Functions

1. Quadratic Functions: Graphing and finding the vertex.
   - Example: Graph f(x)=x2+4x−5f(x) = x^2 + 4x - 5f(x)=x2+4x−5.
2. Exponential Functions: Solving exponential equations.
   - Example: Solve 3x+1=813^{x+1} = 813x+1=81.

5. Complex Numbers

1. Operations with Complex Numbers: Adding and multiplying.
   - Example: Simplify (3+4i)+(1−2i)(3 + 4i) + (1 - 2i)(3+4i)+(1−2i).

6. Assessment

- **Quiz: Covering polynomials, quadratic equations, systems of equations, and exponents.**
- **Homework: Solve 10 problems involving factoring, systems of equations, and exponents.**