1. Define and illustrate axiom, exponent, negative quantity, numeric equation, similar terms.

2. Simplify \( \frac{a^4 - b^4}{a^2 - 2ab + b^2} \times \frac{a - b}{a^2 + ab} \)

3. Find the prime factors of \( 2a^2 - 2a + 2a^2 + 2a + 1, 4x^3 - 9x, x^4 + x^2y + y^3 \)

4. Solve \( \frac{1}{x} + \frac{1}{y} = \frac{5}{6}, \frac{2}{x} - \frac{1}{y} = \frac{2}{3} \)

5. The difference of the squares of two numbers is 81, and \( \frac{1}{3} \) of the smaller is equal to \( \frac{1}{4} \) of the larger; find the numbers.

6. Find the greatest common divisor (highest common factor) of \( 6x^2 + x - x^2 - x + 4x^2 - 6x^2 - 4x + 3 \)

7. Find the least common multiple of \( y^3 - 3y^2 + 2 \) and \( y^3 - 1 \)

8. Solve the following equation and state an axiom as authority for each of the three principal steps: \( \frac{x}{2} + \frac{2x}{3} = 2x - 5 \)

9. Solve \( x^3 - \frac{x}{6} - \frac{1}{3} = 0 \)

10-11. Solve \( x^2 + xy + 4y^2 = 6 \)

12. Expand \( (2a^2 - 3b^3)^3 \) by the binomial theorem, writing all the computations for finding the coefficients.

13. Simplify each of the following: \( \sqrt{75}, \sqrt{81ab^2}, \sqrt{a} \times \sqrt{b}, \sqrt{\frac{12}{16}}, \sqrt{a^2b^2 - a^2b^3} \)

14-15. A person expends \$240 in the purchase of wheat; if he had paid 20 cents a bushel less he could have obtained 100 bushels more for the same money. How many bushels did he buy?