1. Define literal quantity, numeric equation, sign, surd, homogeneous quantity.

2. Simplify \( \left( I + \frac{n-1}{n+1} \right) \div \left( I - \frac{n-1}{n+1} \right) + \left( I + \frac{n+1}{n-1} \right) \div \left( I - \frac{n+1}{n-1} \right) \)

3. Factor \( a^3 - 8, x^2 + x - 12, 2x^2 + 3x - 2, 8a^3 - 32ab^2, 2x^5 + 2x^3y^2 + 2xy^4 \)

4-5 Solve \( ax - 2by = a^2 - 2ab - 2b^2 \)
   \( bx + ay = 2a^2 + 2ab + 2b^2 \)

6. The sum of two numbers is 20 and one half the larger is equal to three fourths the smaller; find the numbers.

7-8 Solve \( x^2 - bx = \frac{4a^2 - 6ab}{9} \)

9-10 Solve \( 3x^2 + 4y^2 = 43 \)
   \( x^2 + 2y = 13 \)

11. Expand \( (x+1)^5 \).

12-13 Solve \( \sqrt{x} + \sqrt{4a+x} = 2\sqrt{b+x} \)

14-15 If a certain number is increased by the sum of its digits the sum is 21; if the number is diminished by twice the sum of its digits the result is 3. Find the number.