

Algebra — Full Revision

Name:

Date:

INQUIRY

Algebra connects everything: expressions describe patterns, substitution tests them, equations solve unknowns, and sequences predict the future. Ready to show what you know?

Discuss with your partner. Write your initial ideas below:

Key Vocabulary

Term	Definition
Expression	Numbers, variables, operations. No equals sign.
Equation	Has an equals sign. Two balanced sides.
Substitution	Replacing a variable with a number.
nth term	Formula for any term in a sequence: $T = dn + c$.

Section 1 — Expressions (8 marks)

1. For $5a - 3b + 7$, identify all terms, coefficients, and constants. [3 marks]

2. Simplify: $8x + 3y - 5x + 2y - 4$ [2 marks]

Show your working:

3. Write an expression for: the cost of n bubble teas at 18 yuan each plus 3 yuan per topping for t toppings. [3 marks]

Section 2 — Substitution (8 marks)

4. If $x = 5$, find: (a) $4x - 3$ (b) $x^2 + 2x$ (c) $3x^2 - 10$ [3 marks]

Show your working:

5. Temperature: $F = 1.8C + 32$. Find F when $C = 20$ (spring in Nanjing) and when $C = -10$ (winter in Seoul). [3 marks]

Show your working:

6. A rectangle has length $(2x + 1)$ cm and width $(x - 3)$ cm. If $x = 7$, find the perimeter. [2 marks]

Show your working:

Section 3 — Equations (10 marks)

7. Solve: $x + 14 = 30$ [1 marks]

Show your working:

8. Solve: $7y = 63$ [1 marks]

Show your working:

9. Solve: $3x + 8 = 29$ [2 marks]

Show your working:

10. Solve: $5m - 12 = 23$ [2 marks]

Show your working:

11. Solve: $(n + 6) / 4 = 5$ [2 marks]

Show your working:

12. A Korean restaurant charges 12,000 won per person plus 8,000 won for banchan (side dishes). The total bill was 68,000 won. How many people ate? [2 marks]

Show your working:

Section 4 — Sequences (8 marks)

13. Find the next 3 terms and the n th term rule for: 7, 12, 17, 22, ... [4 marks]

14. The n th term is $T = 6n - 1$. Find the 25th term and determine which term equals 149. [4 marks]

Show your working:

Section 5 — Problem Solving (6 marks)

15. A phone plan costs 49 yuan per month plus 0.10 yuan per text message. Last month's bill was 73.80 yuan. How many texts were sent? [3 marks]

Show your working:

16. The height of a plant in cm after n weeks follows the rule $H = 3n + 5$. (a) How tall is the plant after 8 weeks? (b) After how many weeks will the plant be 50 cm tall? [3 marks]

Show your working: