GRADE 7 MATHEMATICS

Algebra — Full Revision

Name: Date:

INQUIRY

This unit connects everything: expressions build the language, equations find unknowns, inequalities set boundaries, sequences predict patterns, and graphs make it all visible.

Discuss with your partner. Write your initial ideas below:

Key Vocabulary

Term	Definition
Expand	Multiply out brackets: a(b+c) = ab + ac.
Factorise	Reverse of expanding: ab + ac = a(b+c).
Inequality	Uses <, >, <=, >= instead of =.
y = mx + c	m = gradient, c = y-intercept.

Section 1 — Expressions (10 marks)

1. Expand: 4(3x - 2) [1 marks]

Show your working:

2. Expand and simplify: 3(2a + 5) - 2(a - 4) [3 marks]

Show your working:

3. Factorise: 12x + 18 [1 marks]

Show your working:

4. Factorise fully: 8ab - 20a [2 marks]

Show your working:

5. The cost of a Korean BBQ meal for p people is 5(p + 2) thousand won (including 2 shared platters). Expand and find the cost for 6 people. [3 marks]

Show your working:

Section 2 — Equations (10 marks)

6. Solve: 4(x + 3) = 28 [2 marks]

Show your working:

7. Solve: 6y - 5 = 2y + 19 [2 marks]

Show your working:

8. Solve: 3(2a - 1) = 5(a + 2) [3 marks]

Show your working:

9. Two Nanjing restaurants: Restaurant A charges (40 + 15n) yuan for n dishes. Restaurant B charges (10 + 25n) yuan. For how many dishes do they cost the same? [3 marks]

Show your working:

Section 3 — Inequalities (8 marks)

10. Solve: 5x - 3 > 17 [2 marks]

Show your working:

11. Solve: -4a <= 20 [2 marks]

Show your working:

12. A student has 100,000 won for shopping in Myeongdong, Seoul. T-shirts cost 15,000 won each. (a) Write an inequality. (b) Solve. (c) Maximum t-shirts? [4 marks]

Show your working:

Section 4 — Sequences (8 marks)

13. Find the nth term for: 3, 8, 13, 18, 23, ... Then find the 40th term. [3 marks]

14. T = 7n - 4. (a) Find the 15th term. (b) Is 200 in this sequence? Show working. [3 marks]

Show your working:

15. Nanjing summer temperatures (weekly averages in June): 24, 26, 28, 30, ... (a) nth term? (b) Predict week 8. (c) When does it first exceed 35 degrees C? [2 marks]

Section 5 — Graphs (9 marks)

16. State the gradient and y-intercept of: (a) y = 4x - 3 (b) y = -2x + 10 (c) y = x [3 marks]

17. A ride-sharing app in Nanjing charges C = 1.8d + 8 yuan. (a) State gradient and intercept. (b) What do they mean? (c) Find cost for 12 km. (d) If you paid 44 yuan, how far did you go? [4 marks]

18. Line A: y = 2x + 1. Line B: y = 2x - 3. Line C: y = -x + 1. (a) Which lines are parallel? Why? (b) Do Lines A and C cross? If so, find the intersection point by setting them equal. [2 marks]