GRADE 7 MATHEMATICS

Inequalities

Name: Date:

INQUIRY

A roller coaster at Nanjing Happy Valley requires h >= 140 cm. You are x cm tall. How would you write the rule that decides if you can ride?

Discuss with your partner. Write your initial ideas below:

Key Vocabulary

Term	Definition
Inequality	Compares values using <, >, <=, >=.
Solution set	All values that make the inequality true.
Open circle	< or > (boundary NOT included).
Closed circle	<= or >= (boundary IS included).

Part A — Writing Inequalities

1. Write an inequality for each: (a) You must be at least 140 cm to ride. (b) The speed limit on a Chinese motorway is 120 km/h. (c) A Korean cinema R-rating requires age 18 or over. (d) The temperature in a German fridge must be below 5 degrees C. (e) Nanjing metro children ride free if under 6 AND shorter than 130 cm. [5 marks]

Part B — Solving Inequalities

2. Solve: 3x + 5 > 20 [2 marks]

Show your working:

3. Solve: 4y - 7 <= 13 [2 marks]

Show your working:

4. Solve: 2(a + 3) < 18 [2 marks]

Show your working:

5. Solve: -2x > 8 (careful!) [2 marks]

Show your working:

6. Solve: 5 - 3n >= -7 [2 marks]

Show your working:

Part C — Number Lines

7. Draw a number line and represent each solution: (a) x > 3 (b) x <= -1 (c) -2 < x <= 5. Use open/closed circles correctly. [6 marks]

Part D — Real-World Problems

8. You have 150 yuan to spend at a Nanjing bookshop. Books cost 24 yuan each. (a) Write an inequality. (b) Solve it. (c) What is the maximum number of books you can buy? [3 marks]

Show your working:

9. A Korean student needs at least 80% average across 5 tests. Their first 4 scores are 75, 88, 72, 90. (a) Write an inequality for the 5th test score. (b) What minimum score do they need? [4 marks]

Show your working:

10. A German family's electricity bill must stay under 100 euro/month. They pay 25 euro base + 0.32 euro per kWh. (a) Write an inequality. (b) What is the maximum kWh they can use? (c) If they use 8 kWh per day, will they stay under budget in a 30-day month? [4 marks]

Show your working: