

Sequences & Patterns

Name:

Date:

INQUIRY

Seoul subway fare: 1,350 won, 1,450 won, 1,550 won, 1,650 won... Can you predict the fare for 20 km without listing every value?

Discuss with your partner. Write your initial ideas below:

Key Vocabulary

Term	Definition
Sequence	An ordered list of numbers following a rule.
Common difference	The amount added each time in an arithmetic sequence.
nth term	A formula that gives any term: $T = dn + c$.

Part A — Identifying Sequences

1. Find the next 3 terms: (a) 2, 5, 8, 11, ____, ____, ____ (b) 40, 35, 30, 25, ____, ____, ____ (c) 1, 4, 9, 16, ____, ____, ____
[3 marks]

2. State the common difference for each arithmetic sequence: (a) 3, 7, 11, 15 (b) 50, 45, 40, 35 (c) 1.5, 3.0, 4.5, 6.0
[3 marks]

Part B — Finding the nth Term

3. Find the n th term rule for: 5, 8, 11, 14, 17, ... Show all working clearly. [3 marks]

4. Find the n th term rule for: 3, 7, 11, 15, 19, ... Then find the 50th term. [3 marks]

5. Seoul subway: 1 km = 1,350 won, 2 km = 1,450 won, 3 km = 1,550 won, 4 km = 1,650 won. (a) Common difference? (b) Write the n th term rule. (c) Predict the fare for 10 km. [4 marks]

Part C — Working Backwards

6. The n th term of a sequence is $T = 4n + 1$. (a) Find the 1st, 5th, and 20th terms. (b) Which term has the value 81? [4 marks]

Show your working:

7. The n th term rule is $T = 3n - 2$. Is 100 a term in this sequence? Show your working. [2 marks]

Show your working:

Part D — Challenge

8. The Nanjing metro charges: Zones 1–4 = 2 yuan, Zones 5–8 = 3 yuan, Zones 9–12 = 4 yuan. Is this an arithmetic sequence? How is it different from Seoul's system? Which system is fairer for long journeys? [3 marks]