GRADE 7 MATHEMATICS

Solving Multi-Step Equations

Name: Date:

INQUIRY

Two phone plans: Plan A costs 49 yuan/month + 0.10 yuan/text. Plan B costs 29 yuan/month + 0.30 yuan/text. How many texts make them equal?

Discuss with your partner. Write your initial ideas below:

Key Vocabulary

Term	Definition
Multi-step equation	Needs more than two operations to solve.
Unknowns on both sides	The variable appears on both the left AND right of the equals sign.

Part A — Equations with Brackets

1. Solve: 3(x + 4) = 21 [2 marks]

Show your working:

2. Solve: 5(2y – 1) = 35 [2 marks]

Show your working:

3. Solve: 4(a + 3) – 2 = 22 [3 marks]

Show your working:

4. Solve: 2(3m – 5) + 4 = 20 [3 marks]

Show your working:

Part B — Unknowns on Both Sides

5. Solve: 5x + 3 = 2x + 18 [2 marks]

Show your working:

6. Solve: 7a – 4 = 3a + 20 [2 marks]

Show your working:

7. Solve: 8y + 1 = 3y + 26 [2 marks]

Show your working:

8. Solve: 4(n + 2) = 2(n + 7) [3 marks]

Show your working:

Part C — Real-World Equations

9. Phone plans: 49 + 0.1t = 29 + 0.3t. Find the number of texts (t) where both plans cost the same. [3 marks]

Show your working:

10. Two Korean delivery services: Service A charges 3000 + 500d won. Service B charges 1000 + 1000d won (d = distance in km). At what distance do they cost the same? [3 marks]

Show your working:

11. A German gym offers two memberships: Standard = 30 + 5v euro (v = visits). Premium = 60 euro/month unlimited. After how many visits is Premium better value? [3 marks]

Show your working:

12. Nanjing and Shanghai are 300 km apart. Train A leaves Nanjing at 200 km/h. Train B leaves Shanghai at 150 km/h towards Nanjing at the same time. After how many hours do they meet? (Hint: 200t + 150t = 300) [4 marks]

Show your working: