

CLASS 7 MATHEMATICS

Chapter: Expressions Using Letter-Numbers

NCERT Curriculum (Ganita Prakash) — Case Study Worksheet

General Instructions: Read each context carefully before answering the questions. Express all algebraic terms clearly and simplify where applicable.

Case Study 1: Planning the School Annual Sports Day

The sports teacher of Pragati Public School is organizing the annual sports event. She needs to buy equipment and arrange refreshments for participants.

- The cost of one **volleyball** is ₹ x .
- The cost of one **football** is ₹ y .
- Each student participant is given a refreshment packet costing ₹ 35.
- The ground preparation flat fee is ₹ 1,200.

QUESTIONS:

Q1.1: Write an algebraic expression using letter-numbers to represent the total cost of purchasing 6 volleyballs and 4 footballs.

Q1.2: If n students participate in the event, write an expression for the total expense of ground preparation and student refreshments combined.

Q1.3: Class 7A ordered 3 volleyballs and 2 footballs, while Class 7B ordered 4 volleyballs and 5 footballs. Write a simplified single expression for the total cost of balls ordered by both classes together.

Case Study 2: Classroom Library Setup

Class 7 students decided to set up a class library. They collected storybooks and reference books from students and purchased wooden shelves to store them.

- Number of storybooks collected = p
- Number of reference books collected = q
- Each wooden shelf can hold 25 books.
- The school library club donated 15 extra books to the class collection.

QUESTIONS:

Q2.1: Write an expression for the total number of books in the class library after receiving the donation from the school club.

Q2.2: If 5 storybooks and 3 reference books were lost during shifting, write an expression for the remaining number of books collected by students.

Q2.3: If the total number of books in the library is given by the expression $p + q + 15$, and they fill k full shelves of 25 books each, write an expression for the unassigned books left over.

Case Study 3: The Organic Vegetable Garden

A eco-club in a school planted a rectangular vegetable garden. They planted tomato saplings in rows and cucumber saplings along the border.

- There are r rows of tomato plants, and each row has 12 saplings.
- The length of the rectangular plot is l meters and the breadth is b meters.
- They bought fencing mesh at ₹ 50 per meter to enclose the garden.

QUESTIONS:

Q3.1: Write an algebraic expression for the total number of tomato saplings planted in the garden.

Q3.2: Write an expression using letter-numbers for the total length of fencing required to cover the boundary of the rectangular plot.

Q3.3: Write an expression for the total cost of fencing the entire rectangular garden.

Case Study 4: School Bus Trip to the Science Museum

Students of Class 7 went on an educational trip to a local Science Museum using school buses.

- Distance to the museum is d kilometers.
- The bus travels at an average speed of s km/h.
- The entry ticket price per student is ₹ t .
- The school paid a flat parking fee of ₹ 250 for each bus.

QUESTIONS:

Q4.1: Write an expression using letter-numbers for the total time taken (in hours) by the bus to reach the museum.

Q4.2: If 45 students went on the trip in 1 bus, write an expression for the total money spent on tickets and parking for that bus.

Q4.3: A teacher bought x adult tickets at ₹ 100 each and y student tickets at ₹ t each. Write an expression for the total ticket expenditure.

Case Study 5: Bakery & Snacks Stalls at School Fete

During the school fete, students managed a bakery stall selling homemade cookies and fruit juice packets to raise funds for charity.

- Price of one cookie box = ₹ a
- Price of one juice packet = ₹ b
- The stall paid a fixed booth rental of ₹ 500.

QUESTIONS:

Q5.1: On Day 1, they sold 25 cookie boxes and 40 juice packets. Write an algebraic expression for the total revenue earned on Day 1.

Q5.2: On Day 2, they sold 30 cookie boxes and 20 juice packets. Write a simplified expression for the total revenue earned across both days combined.

Q5.3: Write an expression for the net profit made by the stall over the two days after deducting the fixed booth rental fee.