Basic Mathematical Operators in R Programming

Practice Worksheet with Word Problems and Vector Examples

Objective: To understand and apply arithmetic operators in R through real-life examples and vector-based operations.

List of Basic Operators in R

Operator	Description	Example in R
`+`	Addition	`4 + 3`
`-`	Subtraction	`10 - 6`
`*`	Multiplication	`2 * 5`
`/`	Division	`15 / 3`
`^` or `**`	Exponentiation	`3^2`
`%%`	Modulus (remainder)	`10 %% 3`
`%/%`	Integer Division	`10 %/% 3`

Part A: Word Problems (Single Values)

Solve the following problems using basic operators in R. Write the R code and compute the answer.

1. A pencil costs 8 rupees. Find the total cost of 15 pencils.
   `price <- 8; quantity <- 15; total <- price * quantity`

2. You earned 2500 rupees and spent 875 rupees. Find how much money you have left.
   `earned <- 2500; spent <- 875; remaining <- earned - spent`

3. A box contains 72 candies to be shared equally among 9 children. Find candies per child.
   `candies <- 72; children <- 9; per_child <- candies / children`

4. A worker earns 950 per day. Find total income for 28 days.
   `income <- 950 * 28`

5. A number is 25. Find its square and cube.
   `num <- 25; square <- num^2; cube <- num^3`

6. Divide 125 by 7 and find both quotient and remainder.
   `125 %/% 7; 125 %% 7`

7. The temperature increased from 27°C to 34°C. Find the change.
   `change <- 34 - 27`

8. You have 2500 rupees and each pen costs 45 rupees. Find how many pens you can buy and money left.
   `2500 %/% 45; 2500 %% 45`

9. A car travels 560 km using 40 litres of fuel. Find average km per litre.
   `560 / 40`

10. A train covers 300 km in 5 hours. Find its speed in km/hr.
    `speed <- 300 / 5`

Part B: Vector-Based Arithmetic Operations in R

Now apply similar operations using R vectors.

1. A shop sells items at prices 45, 60, 75. Add a discount of 5 rupees to each.
   `price <- c(45,60,75); discounted <- price - 5`
2. A student scored marks in three subjects: 78, 85, 92. Add 5 grace marks to each subject.
   `marks <- c(78,85,92); newmarks <- marks + 5`
3. Calculate total marks for five students whose marks are:
   Maths = `c(65,72,81,90,55)`
   Science = `c(70,60,85,78,68)`
   `total <- Maths + Science`
4. The number of books sold in January, February, March are 120, 150, 180. Find total books sold.
   `books <- c(120,150,180); sum(books)`
5. You bought apples, bananas, and mangoes costing 120, 60, and 150 respectively. Apply 10% discount on each.
   `fruits <- c(120,60,150); discount <- fruits * 0.1; net <- fruits - discount`
6. Given vectors `x <- c(10,20,30)` and `y <- c(2,4,6)`, find:
   (a) `x + y` (b) `x - y` (c) `x * y` (d) `x / y`
7. Find square of all numbers in `v <- c(3,5,7,9)` using exponentiation.
   `v^2`
8. Given `a <- c(15,28,32,49)`, find remainder when each is divided by 7.
   `a %% 7`
9. You have vectors of income and expenses:
   `income <- c(25000, 30000, 28000)`
   `expense <- c(18000, 24000, 20000)`
   Find savings for each month.
   `savings <- income - expense`
10. Compute total cost of products with quantities and prices:
    `price <- c(25, 40, 35, 60)`
    `qty <- c(3, 2, 5, 1)`
    `total <- price * qty; sum(total)`

Part C: Challenge Section

Predict the result before running the following in R:

1. `(5 + 3) * 2^3`

2. `20 - 4 * 2 + 10 / 5`

3. `15 %% 4 + 3^2`

4. `25 %/% 4 + 25 %% 4`

5. `c(2,4,6)^c(1,2,3)`

— End of Worksheet —