Class 9 Mathematics Worksheet

Chapter 1: Number Systems

Student Details:

Name: _____

Class: _____

Roll No.: _____

Date: _____

Instructions:

- All questions are compulsory.

- Solve the questions in the space provided.

- Show all necessary steps in your calculations.

Section A: Multiple Choice Questions (MCQs)

1. Which of the following numbers is an irrational number?

   a) 22/7 b) √2 c) 0.3333... d) 3/2

2. The decimal expansion of 1/3 is:

   a) 0.3 b) 0.3333... c) 0.33333 (terminating) d) None of the above

3. Which of the following statements is true?

   a) Every whole number is a natural number.

   b) Every natural number is a whole number.

   c) Every rational number is an irrational number.

   d) Every integer is a whole number.

4. Which of the following is a rational number?

   a) √3 b) π c) 0.121221222... d) 5/7

5. The square root of 25.6 lies between which of the following pairs?

a) 5 and 6 b) 4 and 5 c) 6 and 7 d) 3 and 4

Section B: Short Answer Questions

6. Express 0.317(5) as a fraction in the simplest form.
7. Find the value of $5\sqrt{3} \times 2\sqrt{3}$.
8. Simplify $\sqrt{50} + 2\sqrt{18} - 3\sqrt{8}$.
9. Prove that $3\sqrt{2}$ is an irrational number.
10. If $x = 2 + \sqrt{3}$, find the value of $x^2 - 4x + 1$.

Section C: Long Answer Questions

11. Represent $\sqrt{5}$ on the number line. Explain the steps involved.
12. Find the value of $(\sqrt{2} + \sqrt{3}) / (\sqrt{2} - \sqrt{3})$ and rationalize the denominator.
13. If a = 7 + 3√2 and b = 7 - 3√2, find a^2 + b^2.
14. Prove that the square root of any non-perfect square is an irrational number.
15. If $x = 2 / (3 + \sqrt{5})$, simplify the expression and rationalize the denominator.

Section D: Conceptual Questions

16. Explain why $\sqrt{2}$ and $\sqrt{3}$ are irrational numbers.
17. Determine whether the sum of a rational number and an irrational number is rational or irrational. Justify your answer with an example.
18. What is the decimal expansion of 2/11? Is it terminating or non-terminating repeating? Explain.
19. Prove that $\sqrt{7}$ is an irrational number using the method of contradiction.
20. If p and q are two irrational numbers, is their sum always irrational? Justify with examples.