

Rational and Irrational Numbers

Chapter 1: Rational and Irrational Numbers · Topic 1

Key Concept

Rational numbers, like $\frac{3}{4}$ or 5, have terminating or repeating decimal expansions when converted to decimal form.

Irrational numbers, like $\sqrt{2}$ or π , have non-terminating, non-repeating decimal expansions that continue infinitely without pattern.

Together, rational and irrational numbers form the set of real numbers, which can be represented on the number line.

Understanding this distinction helps us classify numbers correctly and work with more complex numbers in advanced algebra and geometry.

Quick Revision Notes

- Rational numbers can be written as $\frac{p}{q}$.
- They have terminating or repeating decimals.
- Irrational numbers cannot be written as $\frac{p}{q}$.
- Examples: $\sqrt{2}$, π .
- They have non-terminating, non-repeating decimals.
- Rational + irrational numbers form real numbers.
- Real numbers can be shown on a number line.
- This distinction is key for advanced maths.

Practice Questions

- 1 Classify 5 numbers as rational or irrational.
- 2 Explain why $\sqrt{2}$ is irrational.
- 3 Discuss why π is important in geometry.
- 4 Find the decimal expansion of $\frac{1}{3}$.
- 5 Show a rational and an irrational number on a number line.
- 6 Discuss real numbers as a combination of both types.