PRACTICE PAPER 07 (2026-27)
CHAPTER 03 THE WORLD OF NUMBERS

SUBJECT: MATHEMATICS **MAX. MARKS : 40**

CLASS : IX **DURATION : 1½ hrs**

General Instructions:

(i). **All** questions are compulsory.

(ii). This question paper contains 2**0** questions divided into five Sections A, B, C, D and E.

(iii). **Section A** comprises of **10 MCQs** of **1 mark** each. **Section B** comprises of 4 questions of **2 marks** each. **Section C** comprises of 3 questions of **3 marks** each. **Section D** comprises of 1 question of **5 marks** each and **Section E** comprises of 2 Case Study Based Questions of **4 marks** each.

(iv). There is no overall choice.

(v). Use of Calculators is not permitted

SECTION – A

Questions 1 to 10 carry 1 mark each.

1. Which of the following fractions has a terminating decimal expansion?

(a) $\frac{11}{36}$ (b) $\frac{19}{250}$ (c) $\frac{13}{42}$ (d) $\frac{17}{90}$

2. Which of the following is irrational?

(a) $0.373737\ldots$ (b) $\frac{25}{7}$ (c) $\sqrt{63}$ (d) 2.125

3. A rational number midway between $\frac{5}{8}$ and $\frac{7}{8}$ is

(a) $\frac{3}{4}$ (b) $\frac{2}{3}$ (c) $\frac{5}{6}$ (d) $\frac{7}{10}$

4. Which of the following lies between $\frac{4}{9}$ and $\frac{5}{9}$?

(a) $\frac{1}{3}$ (b) $\frac{1}{2}$ (c) $\frac{2}{3}$ (d) $\frac{7}{9}$

5. The decimal expansion of $\frac{11}{625}$ terminates after

(a) 2 decimal places (b) 3 decimal places (c) 4 decimal places (d) 5 decimal places

6. The recurring decimal $0.636363\ldots$ is equal to

(a) $\frac{6}{11}$ (b) $\frac{7}{11}$ (c) $\frac{8}{11}$ (d) $\frac{9}{11}$

7. Which of the following is rational?

(a) $\sqrt{98}$ (b) $\sqrt{72}$ (c) $\sqrt{121}$ (d) $\sqrt{45}$

8. The decimal expansion of $\frac{13}{90}$ is

(a) terminating (b) non-terminating recurring

(c) irrational (d) non-recurring

In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

(a) Both A and R are true and R is the correct explanation of A.

(b) Both A and R are true but R is not the correct explanation of A.
(c) A is true but R is false.
(d) A is false but R is true.

9. Assertion (A): Every rational number can be represented on the number line.
Reason (R): Every rational number corresponds to a unique point on the number line.

10. Assertion (A): $\sqrt{49}$ is rational.
Reason (R): 49 is a perfect square.

SECTION – B
Questions 11 to 14 carry 2 marks each.

11. Without performing long division, determine whether $\frac{81}{500}$ has a terminating decimal expansion. Also state the number of decimal places.

12. Find three rational numbers between $\frac{4}{7}$ and $\frac{5}{7}$

13. Represent $\frac{11}{8}$ on the number line.

14. Convert $0.727272\ldots$ into the form $\frac{p}{q}$

SECTION – C
Questions 15 to 17 carry 3 marks each.

15. Prove that $\sqrt{7}$ is an irrational number

16. Express 1.4191919... in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$.

17. Convert $3.18686868\ldots$ into the form $\frac{p}{q}$

SECTION – D
Questions 18 carry 5 marks each.

18. A mathematics teacher asked students to analyse the following rational numbers:

$$\frac{19}{640}, \frac{17}{252}, \frac{23}{1250}, \frac{31}{198}, \frac{29}{3125}$$

Using prime factorisation of denominators, determine which fractions have terminating decimal expansions and which have non-terminating recurring decimal expansions.

SECTION – E (Case Study Based Questions)
Questions 19 to 20 carry 4 marks each.

19. Case Study -1: Rational Numbers in School Attendance Analysis
A school conducted an attendance analysis for Class IX students over several months. Different sections reported attendance as fractions of the total number of working days. These fractions were displayed on a digital dashboard for comparison. During the discussion, students observed that between any two attendance fractions, many other fractions could be inserted. Their teacher encouraged them to calculate averages of pairs of fractions repeatedly. Each average produced another rational number lying between the original fractions. Students realized that this process could continue indefinitely. Through this activity, they understood the density property of rational numbers and their representation on the number line.

(i) Find one rational number between $\frac{1}{3}$ and $\frac{7}{9}$ (1)

(ii) Find one rational number between $\frac{5}{9}$ and $\frac{7}{9}$ (1)

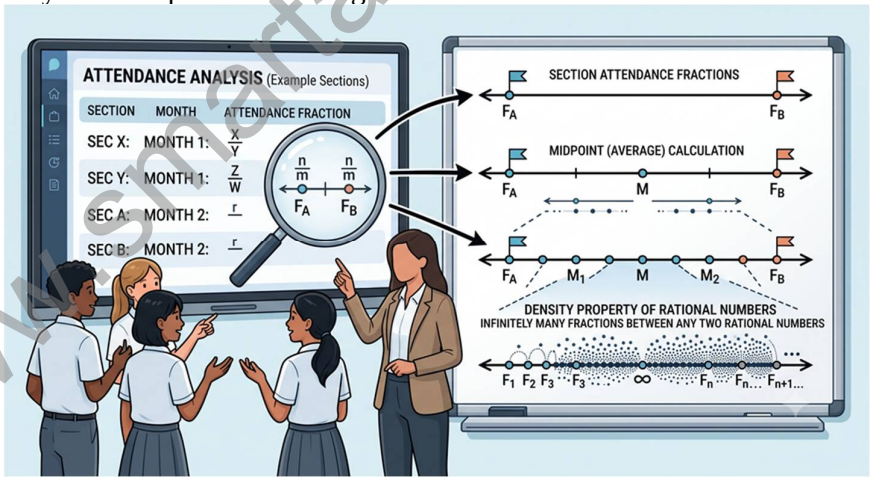
(iii) Arrange the following rational numbers in ascending order: $\frac{1}{3}$, $\frac{5}{9}$, $\frac{2}{3}$, $\frac{7}{9}$ (2)

OR

(iii) A student claims that $\frac{5}{9}$ lies exactly midway between $\frac{1}{3}$ and $\frac{7}{9}$. Is the student's claim correct? Justify your answer. (2)

20. Case Study -2: Understanding Decimal Expansions Through Financial Data

During a financial literacy programme, students compared fractions representing savings made by different groups of students. They converted the fractions into decimal form and noticed that some decimals terminated while others continued indefinitely in a repeating pattern. To understand the reason, the teacher guided students to express denominators as products of prime factors. Students discovered that denominators containing only factors 2 and 5 produced terminating decimals, whereas denominators containing other prime factors produced recurring decimals. This activity helped students connect rational numbers, prime factorisation and decimal representation while developing analytical and problem-solving skills in a real-life context.



(i) Determine whether $\frac{13}{250}$ has a terminating decimal expansion.

(ii) Determine whether $\frac{17}{108}$ has a terminating decimal expansion.

(iii) Determine whether $\frac{19}{625}$ has a terminating decimal expansion.

(iv) Determine whether $\frac{23}{294}$ has a terminating decimal expansion.

PRACTICE PAPER 07 (2026-27)
CHAPTER 03 THE WORLD OF NUMBERS
(ANSWERS)

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(iv). There is no overall choice.

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SECTION – A

Questions 1 to 10 carry 1 mark each.

1. Which of the following fractions has a terminating decimal expansion?

(a) $\frac{11}{36}$ (b) $\frac{19}{250}$ (c) $\frac{13}{42}$ (d) $\frac{17}{90}$

Ans: (b) $\frac{19}{250}$

$250 = 2 \times 5^3$

Only factors 2 and 5 occur.

2. Which of the following is irrational?

(a) $0.373737\ldots$ (b) $\frac{25}{7}$ (c) $\sqrt{63}$ (d) 2.125

Ans: (c) $\sqrt{63}$

$\sqrt{63} = 3\sqrt{7}$

Since $\sqrt{7}$ is irrational, $\sqrt{63}$ is irrational.

3. A rational number midway between $\frac{5}{8}$ and $\frac{7}{8}$ is

(a) $\frac{3}{4}$ (b) $\frac{2}{3}$ (c) $\frac{5}{6}$ (d) $\frac{7}{10}$

Ans: (a) $\frac{3}{4}$

$\frac{\frac{5}{8}+\frac{7}{8}}{2} = \frac{\frac{12}{8}}{2} = \frac{3}{4}$

4. Which of the following lies between $\frac{4}{9}$ and $\frac{5}{9}$?

(a) $\frac{1}{3}$ (b) $\frac{1}{2}$ (c) $\frac{2}{3}$ (d) $\frac{7}{9}$

Ans: (b) $\frac{1}{2}$

$\frac{4}{9} = 0.444\ldots$, $\frac{5}{9} = 0.555\ldots$ and $\frac{1}{2} = 0.5$

5. The decimal expansion of $\frac{11}{625}$ terminates after

(a) 2 decimal places (b) 3 decimal places (c) 4 decimal places (d) 5 decimal places

Ans: (c) 4 decimal places
$625 = 5^4$
Highest power $= 4$

6. The recurring decimal $0.636363\ldots$ is equal to
(a) $\frac{6}{11}$ (b) $\frac{7}{11}$ (c) $\frac{8}{11}$ (d) $\frac{9}{11}$
Ans: (b) $\frac{7}{11}$
$\frac{7}{11} = 0.636363\ldots$

7. Which of the following is rational?
(a) $\sqrt{98}$ (b) $\sqrt{72}$ (c) $\sqrt{121}$ (d) $\sqrt{45}$
Ans: (c) $\sqrt{121}$
$\sqrt{121} = 11$

8. The decimal expansion of $\frac{13}{90}$ is
(a) terminating (b) non-terminating recurring
(c) irrational (d) non-recurring
Ans: (b) non-terminating recurring
$90 = 2 \times 3^2 \times 5$
Factor 3 occurs.

In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.
(a) Both A and R are true and R is the correct explanation of A.
(b) Both A and R are true but R is not the correct explanation of A.
(c) A is true but R is false.
(d) A is false but R is true.

9. **Assertion (A):** Every rational number can be represented on the number line.
Reason (R): Every rational number corresponds to a unique point on the number line.
Ans: (a) Both A and R are true and R is the correct explanation.

10. **Assertion (A):** $\sqrt{49}$ is rational.
Reason (R): 49 is a perfect square.
Ans: (a) Both A and R are true and R is the correct explanation.

SECTION – B
Questions 11 to 14 carry 2 marks each.

11. Without performing long division, determine whether $\frac{81}{500}$ has a terminating decimal expansion. Also state the number of decimal places.
Ans: $500 = 2^2 \times 5^3$
Only factors 2 and 5 occur.
Therefore decimal expansion terminates.
Highest power $= 3$
Hence, $\frac{81}{500}$ has a terminating decimal expansion with 3 decimal places.

12. Find three rational numbers between $\frac{4}{7}$ and $\frac{5}{7}$

Ans: $\frac{4}{7} = \frac{40}{70}$ and $\frac{5}{7} = \frac{50}{70}$

Three rational numbers are $\frac{41}{70}, \frac{42}{70}, \frac{43}{70}$

13. Represent $\frac{11}{8}$ on the number line.

Ans: $\frac{11}{8} = 1 + \frac{3}{8}$

Divide the interval from 1 to 2 into 8 equal parts.

Locate the third division after 1.

The point representing $\frac{11}{8}$ lies at $1\frac{3}{8}$ on the number line.

14. Convert $0.727272\ldots$ into the form $\frac{p}{q}$

Ans: Let $x = 0.727272\ldots$

$\Rightarrow 100x = 72.727272\ldots$

Subtracting, $100x - x = 72.727272\ldots - 0.727272\ldots$

$\Rightarrow 99x = 72$

$\Rightarrow x = \frac{72}{99}$

$\Rightarrow x = \frac{8}{11}$

SECTION – C

Questions 15 to 17 carry 3 marks each.

15. Prove that $\sqrt{7}$ is an irrational number

Ans: Let us assume that $\sqrt{7}$ is a rational number such that

$\sqrt{7} = \frac{p}{q}$ where p and q are co-prime integers.

Squaring both sides, we get $7 = \frac{p^2}{q^2}$

$\Rightarrow p^2 = 7q^2$

Thus, p^2 is divisible by 7.

Hence, p is divisible by 7.

Let us assume that $p = 7k$, where k is any integer

Substituting, $49k^2 = 7q^2$

$\Rightarrow 7k^2 = q^2$

Thus, q is also divisible by 7.

From above we conclude that p and q have a common factor 7.

This contradicts the assumption that p and q are co-prime.

Therefore our assumption is wrong. Hence $\sqrt{7}$ is an irrational number.

16. Express 1.4191919... in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$.

Ans. Let x = 1.4191919... = $1.4\overline{19}$

Multiplying both sides by 10, we get $10x = 14.\overline{19}$

Here, two digits are repeated continuously, therefore, again multiplying both sides by 100, we get

$1000\,x = 14.19\overline{19} = 1405 + 14.\overline{19} = 1405 + 10\,x$
$\Rightarrow 1000\,x - 10\,x = 1405 \Rightarrow 990\,x = 1405$
$\Rightarrow x = \frac{1405}{990} = \frac{281}{198}$

17. Convert $3.18686868\ldots$ into the form $\frac{p}{q}$

Ans: Let $x = 3.18686868\ldots$
$\Rightarrow 10x = 31.8686868\ldots$
$\Rightarrow 1000x = 3186.8686868\ldots$
Subtracting, $1000x - 10x = 3186.8686868\ldots - 31.8686868\ldots$
$\Rightarrow 990x = 3155$
$\Rightarrow x = \frac{3155}{990}$
$\Rightarrow x = \frac{631}{198}$

SECTION – D
Questions 18 carry 5 marks each.

18. A mathematics teacher asked students to analyse the following rational numbers:

$$\frac{19}{640}, \frac{17}{252}, \frac{23}{1250}, \frac{31}{198}, \frac{29}{3125}$$

Using prime factorisation of denominators, determine which fractions have terminating decimal expansions and which have non-terminating recurring decimal expansions.
Ans. $640 = 2^7 \times 5$
Since, it has only 2 and 5 as factors, therefore it has terminating decimal expansion.
$252 = 2^2 \times 3^2 \times 7$
Since it has 3 as well as 7 had factors, therefore it has non-terminating Recurring decimal expansion
$1250 = 2 \times 5^4$
Since, it has only 2 and 5 as factors, therefore it has terminating decimal expansion.
$198 = 2 \times 3^2 \times 11$
Since it has 3 as well as 7 had factors, therefore it has non-terminating Recurring decimal expansion
$3125 = 5^5$
Since, it has only 5 as factors, therefore it has terminating decimal expansion.
Terminating Decimal Expansions

$$\frac{19}{640}, \frac{23}{1250}, \frac{29}{3125}$$

Non-Terminating Recurring Decimal Expansions

$$\frac{17}{252}, \frac{31}{198}$$

SECTION – E (Case Study Based Questions)
Questions 19 to 20 carry 4 marks each.

19. Case Study -1: Rational Numbers in School Attendance Analysis
A school conducted an attendance analysis for Class IX students over several months. Different sections reported attendance as fractions of the total number of working days. These fractions were displayed on a digital dashboard for comparison. During the discussion, students observed that between any two attendance fractions, many other fractions could be inserted. Their teacher encouraged them to calculate averages of pairs of fractions repeatedly. Each average produced another rational number lying between the original fractions. Students realized that this process

could continue indefinitely. Through this activity, they understood the density property of rational numbers and their representation on the number line.

(i) Find one rational number between $\frac{1}{3}$ and $\frac{7}{9}$ (1)

(ii) Find one rational number between $\frac{5}{9}$ and $\frac{7}{9}$ (1)

(iii) Arrange the following rational numbers in ascending order: $\frac{1}{3}, \frac{5}{9}, \frac{2}{3}, \frac{7}{9}$ (2)

OR

(iii) A student claims that $\frac{5}{9}$ lies exactly midway between $\frac{1}{3}$ and $\frac{7}{9}$. Is the student's claim correct? Justify your answer. (2)

Ans: (i) $\frac{1}{3} = \frac{3}{9}$

Now, $\frac{\frac{3}{9}+\frac{7}{9}}{2} = \frac{5}{9}$

(ii) $\frac{\frac{5}{9}+\frac{7}{9}}{2} = \frac{6}{9} = \frac{2}{3}$

(iii) Taking LCM of the denominators, $\frac{1}{3} = \frac{3}{9}, \frac{5}{9} = \frac{5}{9}, \frac{2}{3} = \frac{6}{9}, \frac{7}{9} = \frac{7}{9}$

Hence, $\frac{1}{3} < \frac{5}{9} < \frac{2}{3} < \frac{7}{9}$

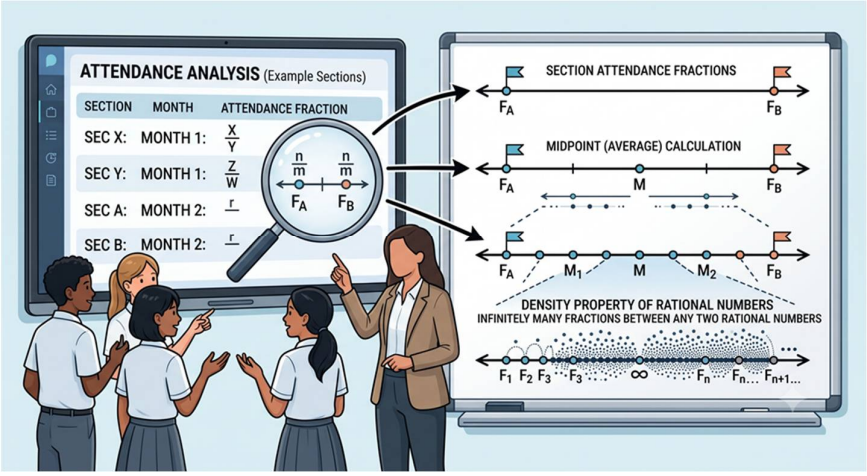
OR

(iii) The midpoint of $\frac{1}{3}$ and $\frac{7}{9}$ is $\frac{\frac{1}{3}+\frac{7}{9}}{2} = \frac{\frac{3}{9}+\frac{7}{9}}{2} = \frac{10}{18} = \frac{5}{9}$

Therefore, the student's claim is correct.

20. Case Study -2: Understanding Decimal Expansions Through Financial Data

During a financial literacy programme, students compared fractions representing savings made by different groups of students. They converted the fractions into decimal form and noticed that some decimals terminated while others continued indefinitely in a repeating pattern. To understand the reason, the teacher guided students to express denominators as products of prime factors. Students discovered that denominators containing only factors 2 and 5 produced terminating decimals, whereas denominators containing other prime factors produced recurring decimals. This activity helped students connect rational numbers, prime factorisation and decimal representation while developing analytical and problem-solving skills in a real-life context.



(i) Determine whether $\frac{13}{250}$ has a terminating decimal expansion.

(ii) Determine whether $\frac{17}{108}$ has a terminating decimal expansion.

(iii) Determine whether $\frac{19}{625}$ has a terminating decimal expansion.

(iv) Determine whether $\frac{23}{294}$ has a terminating decimal expansion.

Ans: (i) $250 = 2 \times 5^3$
Terminating.
(ii) $108 = 2^2 \times 3^3$
Non-terminating Recurring.
(iii) $625 = 5^4$
Terminating.
(iv) $294 = 2 \times 3 \times 7^2$
Non-terminating Recurring.