

PRACTICE PAPER 08 (2026-27)
CHAPTER 03 THE WORLD OF NUMBERS

SUBJECT: MATHEMATICS

CLASS : IX

MAX. MARKS : 40

DURATION : 1½ hrs

General Instructions:

- (i). All questions are compulsory.
- (ii). This question paper contains 20 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) $\frac{23}{72}$ (b) $\frac{19}{150}$ (c) $\frac{27}{320}$ (d) $\frac{11}{84}$
2. Which of the following is irrational?
(a) $\frac{31}{17}$ (b) 0.818181... (c) $\sqrt{108}$ (d) 6.125
3. A rational number exactly halfway between $\frac{1}{3}$ and $\frac{2}{3}$ is
(a) $\frac{1}{2}$ (b) $\frac{4}{9}$ (c) $\frac{5}{9}$ (d) $\frac{3}{4}$
4. Which of the following lies between $\frac{2}{5}$ and $\frac{1}{2}$?
(a) $\frac{3}{8}$ (b) $\frac{1}{3}$ (c) $\frac{1}{5}$ (d) $\frac{9}{20}$
5. The decimal expansion of $\frac{39}{2500}$ terminates after
(a) 2 decimal places (b) 3 decimal places (c) 4 decimal places (d) 5 decimal places
6. The recurring decimal 0.545454... is equal to
(a) $\frac{5}{11}$ (b) $\frac{6}{11}$ (c) $\frac{7}{11}$ (d) $\frac{8}{11}$
7. Which of the following is rational?
(a) $\sqrt{200}$ (b) $\sqrt{99}$ (c) $\sqrt{144}$ (d) $\sqrt{80}$
8. Which of the following has a non-terminating recurring decimal expansion?
(a) $\frac{7}{160}$ (b) $\frac{9}{125}$ (c) $\frac{11}{180}$ (d) $\frac{17}{500}$

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): Rational number lying between two rational numbers x and y is $\frac{1}{2}(x + y)$.

Reason (R): There is one rational number lying between any two rational numbers.

10. Assertion (A): Every recurring decimal represents a rational number.

Reason (R): Every recurring decimal can be converted into the form $\frac{p}{q}$, where $q \neq 0$.

SECTION – B

Questions 11 to 14 carry 2 marks each.

11. What number should be subtracted from $\frac{-7}{8}$ so as to get $\frac{5}{12}$?

12. Find two different irrational numbers between the rational numbers $\frac{5}{7}$ and $\frac{9}{11}$.

13. Without performing long division, determine whether $\frac{91}{160}$ has a terminating decimal expansion.
 Also state the number of decimal places.

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

SECTION – C

Questions 15 to 17 carry 3 marks each.

15. Arrange the rational numbers $\frac{-3}{7}$, $\frac{5}{-14}$, $\frac{-7}{12}$ in ascending order.

16. Prove that $\sqrt{5}$ is an irrational number.

17. Represent $\sqrt{2}$ on the real number line.

SECTION – D

Questions 18 carry 5 marks each.

18. Express $0.6 + 0.\bar{7} + 0.4\bar{7}$ in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$.

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 group of students visited a Mathematics Exhibition where a large "Number Line Wall" was displayed. The wall showed various rational numbers marked between 0 and 1. Students observed that between any two rational numbers, more rational numbers could always be inserted. To verify this idea, they selected the numbers $\frac{2}{5}$ and $\frac{3}{5}$ and repeatedly found averages of the two numbers. They discovered that no matter how many rational numbers were inserted, there was always room

to place another rational number. This helped them understand an important property of rational numbers called the **density property**.



(a) Find four rational numbers between $\frac{3}{4}$ and $\frac{4}{5}$. (2)

(b) Find one rational number between $\frac{2}{5}$ and $\frac{3}{5}$. (1)

(c) How many rational numbers exist between two rational numbers? (1)

20. In January 2021, the vaccination drive for COVID -19 started in 7 states of a country. More than 60% of the people were vaccinated in 4 states out of 7 states. In one of the state vaccination drive has not been started due to flood although vaccine dose was supplied to that state in advance. In February 2021, 4 more states were included in this drive and 2 states have got remarkable response from the people and more than 80% of the population got vaccinated there. Using this information answer the following questions:



(a) In January 2021, more than 60% of people were vaccinated in 4 states out of 7 states. Find the decimal representation of $\frac{4}{7}$. (2)

(b) In 2 states out of 11 states, more than 80% of people participated in vaccination drive in two months. Find the decimal form of $\frac{2}{11}$. (2)

OR

(b) The fraction for state where vaccination not started in January 2021 is $\frac{1}{7}$ and its decimal form is $\overline{0.142857}$. Find the decimal form of $\frac{6}{7}$. (2)

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(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) $\frac{23}{72}$ (b) $\frac{19}{150}$ (c) $\frac{27}{320}$ (d) $\frac{11}{84}$

Ans: (c) $\frac{27}{320}$

$320 = 2^6 \times 5$

Only factors 2 and 5 occur.

2. Which of the following is irrational?

(a) $\frac{31}{17}$ (b) 0.818181... (c) $\sqrt{108}$ (d) 6.125

Ans: (c) $\sqrt{108}$

$\sqrt{108} = 6\sqrt{3}$

Since, $\sqrt{3}$ is irrational, $\sqrt{108}$ is irrational.

3. A rational number exactly halfway between $\frac{1}{3}$ and $\frac{2}{3}$ is

(a) $\frac{1}{2}$ (b) $\frac{4}{9}$ (c) $\frac{5}{9}$ (d) $\frac{3}{4}$

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

$\frac{\frac{1}{3} + \frac{2}{3}}{2} = \frac{1}{2}$

4. Which of the following lies between $\frac{2}{5}$ and $\frac{1}{2}$?

(a) $\frac{3}{8}$ (b) $\frac{1}{3}$ (c) $\frac{1}{5}$ (d) $\frac{9}{20}$

Ans: (d) $\frac{9}{20}$

$\frac{2}{5} = 0.4$ and $\frac{1}{2} = 0.5$

$\frac{3}{8} = 0.375$, $\frac{9}{20} = 0.45$

5. The decimal expansion of $\frac{39}{2500}$ terminates after

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

Ans: (c) 4 decimal places

$$2500 = 2^2 \times 5^4$$

Highest power = 4

6. The recurring decimal 0.545454... is equal to

(a) $\frac{5}{11}$ (b) $\frac{6}{11}$ (c) $\frac{7}{11}$ (d) $\frac{8}{11}$

Ans: (b) $\frac{6}{11}$

$$\frac{6}{11} = 0.545454...$$

7. Which of the following is rational?

(a) $\sqrt{200}$ (b) $\sqrt{99}$ (c) $\sqrt{144}$ (d) $\sqrt{80}$

Ans: (c) $\sqrt{144}$

$$\sqrt{144} = 12$$

8. Which of the following has a non-terminating recurring decimal expansion?

(a) $\frac{7}{160}$ (b) $\frac{9}{125}$ (c) $\frac{11}{180}$ (d) $\frac{17}{500}$

Ans: (c) $\frac{11}{180}$

$$180 = 2^2 \times 3^2 \times 5$$

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):** Rational number lying between two rational numbers x and y is $\frac{1}{2}(x + y)$.

Reason (R): There is one rational number lying between any two rational numbers.

Ans: (c) Assertion (A) is true but reason (R) is false.

10. **Assertion (A):** Every recurring decimal represents a rational number.

Reason (R): Every recurring decimal can be converted into the form $\frac{p}{q}$, where $q \neq 0$.

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. What number should be subtracted from $\frac{-7}{8}$ so as to get $\frac{5}{12}$?

Ans: Difference of the given numbers and the required number = $\frac{5}{12}$

$$\text{The given number} = \frac{-7}{8}$$

$\therefore$ Required number = Given number - Difference

$$= \frac{-7}{8} - \frac{5}{12} = \frac{-7 \times 3 - 5 \times 2}{24} = \frac{-21 - 10}{24} = \frac{-31}{24}.$$

12. Find two different irrational numbers between the rational numbers $\frac{5}{7}$ and $\frac{9}{11}$.

Ans: The given two rational numbers are $\frac{5}{7}$ and $\frac{9}{11}$.

$\frac{5}{7} = 0.714285714.....$ and $\frac{9}{11} = 0.81818181.....$

Hence, the three irrational numbers between $\frac{5}{7}$ and $\frac{9}{11}$ can be:

$0.730730073000...$ and $0.808008000...$

13. Without performing long division, determine whether $\frac{91}{160}$ has a terminating decimal expansion.

Also state the number of decimal places.

Ans: $160 = 2^5 \times 5$

Only factors 2 and 5 occur.

Hence decimal expansion terminates.

Highest power = 5

Hence, $\frac{91}{160}$ has a terminating decimal expansion with 5 decimal places.

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

Ans: Let $x = 0.727272...$

$\Rightarrow 100x = 72.727272...$

Subtracting, $100x - x = 72.727272... - 0.727272...$

$\Rightarrow 99x = 72$

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

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

SECTION – C

Questions 15 to 17 carry 3 marks each.

15. Arrange the rational numbers $\frac{-3}{7}$, $\frac{5}{-14}$, $-\frac{7}{12}$ in ascending order.

Ans:

LCM of 7, 14 and 12 = $7 \times 2 \times 6 = 84$.

$$\frac{-3}{7} = \frac{-3 \times 12}{7 \times 12} = \frac{-36}{84}, \quad \frac{5}{-14} = \frac{-5 \times 6}{14 \times 6} = \frac{-30}{84}, \quad \frac{-7}{12} = \frac{-7 \times 7}{12 \times 7} = \frac{-49}{84}.$$

Since, $-49 < -36 < -30$, therefore, $\frac{-49}{84} < \frac{-36}{84} < \frac{-30}{84}$

$\therefore \frac{-7}{12} < \frac{-3}{7} < \frac{5}{-14}$, i.e., $-\frac{7}{12}$, $\frac{-3}{7}$ and $\frac{5}{-14}$ are in ascending order.

16. Prove that $\sqrt{5}$ is an irrational number.

Ans: Let $\sqrt{5}$ is a rational number then we have $\sqrt{5} = \frac{p}{q}$, where p and q are co-primes.

$$\Rightarrow p = \sqrt{5}q$$

Squaring both sides, we get $p^2 = 5q^2$

$\Rightarrow p^2$ is divisible by 5 $\Rightarrow p$ is also divisible by 5

So, assume $p = 5m$ where m is any integer.

Squaring both sides, we get $p^2 = 25m^2$

But $p^2 = 5q^2$

Therefore, $5q^2 = 25m^2 \Rightarrow q^2 = 5m^2 \Rightarrow q^2$ is divisible by 5 $\Rightarrow q$ is also divisible by 5

From above we conclude that p and q have one common factor i.e. 5 which contradicts that p and q are co-primes.

Therefore, our assumption is wrong.

Hence, $\sqrt{5}$ is an irrational number.

17. Represent $\sqrt{2}$ on the real number line.

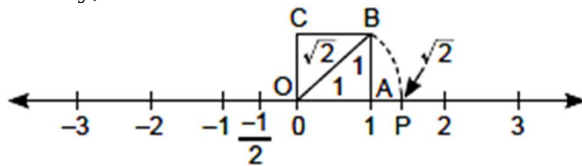
Ans: Using Pythagoras theorem, $\sqrt{2} = \sqrt{1^2 + 1^2}$

$$\Rightarrow OB = \sqrt{OA^2 + AB^2} = \sqrt{2}$$

Hence, take OA = 1 unit on the number line and AB = 1 unit, which is perpendicular to OA.

With O as centre and OB as radius, we draw an arc to intersect the number line at P. Then P corresponds to $\sqrt{2}$ on the number line as shown in figure.

Clearly, OP = OB = $\sqrt{2}$



SECTION – D

Questions 18 carry 5 marks each.

18. Express $0.6 + 0.\bar{7} + 0.4\bar{7}$ in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$.

Ans:

Given $x = 0.6 + 0.\bar{7} + 0.4\bar{7}$

Let $x_1 = 0.6, x_2 = 0.\bar{7}$ and $x_3 = 0.4\bar{7}$

Consider $x_1 = 0.6$

$$\Rightarrow 10x_1 = 6$$

$$x_1 = \frac{6}{10} \quad \dots(i)$$

Consider $x_2 = 0.\bar{7} = 0.777\dots$

$$10x_2 = 7.777\dots = 7.\bar{7}$$

$$= 7 + 0.\bar{7} = 7 + x_2$$

$$\Rightarrow 10x_2 - x_2 = 7$$

$$\Rightarrow 9x_2 = 7$$

$$\Rightarrow x_2 = \frac{7}{9} \quad \dots(ii)$$

Now consider $x_3 = 0.4\bar{7}$

$$10x_3 = 4.\bar{7} = 4.77\dots$$

and $100x_3 = 47.\bar{7}$

$$\therefore 100x_3 - 10x_3 = 47.\bar{7} - 4.\bar{7}$$

$$\Rightarrow 90x_3 = 43$$

$$\Rightarrow x_3 = \frac{43}{90} \quad \dots(iii)$$

So, using $x = x_1 + x_2 + x_3 = 0.6 + 0.\overline{7} + 0.4\overline{7}$

$$= \frac{6}{10} + \frac{7}{9} + \frac{43}{90}$$

$$= \frac{54 + 70 + 43}{90} = \frac{167}{90}$$

SECTION – E (Case Study Based Questions)

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19. Case Study -1: Rational Numbers in School Attendance Analysis

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- (a) Find four rational numbers between $\frac{3}{4}$ and $\frac{4}{5}$. (2)
- (b) Find one rational number between $\frac{2}{5}$ and $\frac{3}{5}$. (1)
- (c) How many rational numbers exist between two rational numbers? (1)

Ans: (a) $\frac{3}{4} = \frac{150}{200}$ and $\frac{4}{5} = \frac{160}{200}$

Required rational numbers:

$$\frac{151}{200}, \frac{152}{200}, \frac{153}{200}, \frac{154}{200}$$

(b) $\frac{\frac{2}{5} + \frac{3}{5}}{2} = \frac{1}{2}$

(c) Infinitely many.

20. In January 2021, the vaccination drive for COVID -19 started in 7 states of a country. More than 60% of the people were vaccinated in 4 states out of 7 states, In one of the state vaccination drive has not been started due to flood although vaccine dose was supplied to that state in advance. In February 2021, 4 more states were included in this drive and 2 states have got remarkable response from the people and more than 80% of the population got vaccinated there. Using this information answer the following questions:



(a) In January 2021, more than 60% of people were vaccinated in 4 states out of 7 states. Find the decimal representation of $\frac{4}{7}$ (2)

(b) In 2 states out of 11 states, more than 80% of people participated in vaccination drive in two months. Find the decimal form of $\frac{2}{11}$ (2)

OR

(b) The fraction for state where vaccination not started in January 2021 is $\frac{1}{7}$ and its decimal form is $0.\overline{142857}$. Find the decimal form of $\frac{6}{7}$. (2)

Ans:

(a) Dividing 4 by 7 as:

$$\begin{array}{r}
 7 \overline{)4.0000000} 0.571428 \\
 \underline{-35} \\
 50 \\
 \underline{-49} \\
 10 \\
 \underline{-7} \\
 30 \\
 \underline{-28} \\
 20 \\
 \underline{-14} \\
 60 \\
 \underline{-56} \\
 40
 \end{array}$$

Ans. = 0.571428

(b) Decimal form of

$$\frac{2}{11} = 0.181818 = 0.\overline{18}$$

$$11 \overline{) 2.0000000} \quad 0.181818$$

$$\begin{array}{r} -11 \\ \hline 90 \\ -88 \\ \hline 20 \\ -11 \\ \hline 90 \\ -88 \\ \hline 20 \\ -11 \\ \hline 90 \\ -88 \\ \hline 20 \end{array}$$

OR

$$\text{If } \frac{1}{7} \text{ is } 0.\overline{142857}$$

$$\text{then } \frac{6}{7} \text{ is}$$

$$6 \times \frac{1}{7} = 0.\overline{857142}$$

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