

Rational Numbers

Mathematics · Class 8 · Topic-wise Practice Worksheet

TIME 45 minutes	QUESTIONS 18	TOTAL MARKS 24	MAX. SCORE ___ / 24
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Name: _____ Class/Sec: _____ Date: _____

INSTRUCTIONS

- There are **18 questions** in this worksheet. All questions are compulsory.
- Each question has four options (A), (B), (C) and (D). Exactly **one** option is correct.
- Questions 1–15 carry **1 mark** each. Questions 16–18 (Achievers Section) carry **3 marks** each.
- There is no negative marking. Use of a calculator is **not** allowed.
- Rough work may be done on the blank space at the side of each page.

Section A — Mathematical Reasoning

Q1–Q8 · 1 mark each

1. The additive inverse of $\frac{-5}{7}$ is _____.

(A) $\frac{5}{7}$

(B) $\frac{-7}{5}$

(C) $\frac{7}{5}$

(D) 0

2. Which rational number is its own additive inverse?

(A) 1

(B) -1

(C) 0

(D) There is no such number

3. The multiplicative identity for rational numbers is _____.

(A) 0

(B) 1

(C) -1

(D) Does not exist

4. The reciprocal of $\frac{-7}{9}$ is _____.

(A) $\frac{7}{9}$

(B) $\frac{9}{7}$

(C) $\frac{-7}{9}$

(D) $\frac{-9}{7}$

5. The statement $a \times (b + c) = a \times b + a \times c$ illustrates the _____ property.

(A) Distributive

(B) Associative

(C) Commutative

(D) Closure

6. Between which two consecutive integers does $\frac{-11}{4}$ lie?

(A) -2 and -1

(B) -4 and -3

(C) -3 and -2

(D) 2 and 3

7. The value of $\frac{2}{3} \times \frac{-6}{7}$ is _____.

(A) $\frac{-7}{4}$

(B) $\frac{4}{7}$

(C) $\frac{-12}{7}$

(D) $\frac{-4}{7}$

8. The value of $\frac{-5}{8} \div \frac{15}{16}$ is _____.

(A) $\frac{-2}{3}$

(B) $\frac{-3}{2}$

(C) $\frac{-75}{128}$

(D) $\frac{2}{3}$

Section B — Everyday Mathematics and Reasoning

Q9–Q15 · 1 mark each

9. In the number line shown, which labelled point represents $\frac{-5}{4}$?

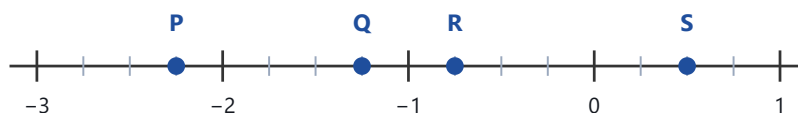


Fig. 9.1 — Each unit is divided into four equal parts

(A) P

(B) Q

(C) R

(D) S

10. Which of the following rational numbers lies between $\frac{1}{3}$ and $\frac{1}{2}$?

(A) $\frac{1}{4}$

(B) $\frac{2}{3}$

(C) $\frac{5}{12}$

(D) $\frac{7}{12}$

11. The sum of two rational numbers is $\frac{-7}{9}$. If one of them is $\frac{2}{3}$, the other is _____.

(A) $\frac{-1}{9}$

(B) $\frac{-5}{9}$

(C) $\frac{13}{9}$

(D) $\frac{-13}{9}$

12. Using a suitable property, the value of $\frac{7}{11} \times \frac{3}{5} + \frac{7}{11} \times \frac{2}{5}$ is _____.

(A) $\frac{7}{11}$

(B) $\frac{7}{55}$

(C) $\frac{14}{11}$

(D) 1

13. A shopkeeper had $25\frac{1}{2}$ kg of rice and sold $12\frac{3}{4}$ kg of it. How much rice is left?

(A) $12\frac{1}{4}$ kg

(B) $12\frac{3}{4}$ kg

(C) $13\frac{1}{4}$ kg

(D) $11\frac{3}{4}$ kg

14. How many rational numbers lie between $\frac{1}{4}$ and $\frac{1}{2}$?
- (A) One
(B) Three
(C) Infinitely many
(D) Eleven
15. A wire of length $15\frac{3}{4}$ m is cut into 7 equal pieces. The length of each piece is _____.
- (A) 3 m
(B) $2\frac{1}{2}$ m
(C) $2\frac{3}{4}$ m
(D) $2\frac{1}{4}$ m

Achievers Section

Q16–Q18 · 3 marks each

16. Consider the following statements.
 (i) Every integer is a rational number.
 (ii) Every rational number is an integer.
 (iii) 0 has no reciprocal.
 Which of the statements is/are correct?
- (A) (i) and (ii) only
(B) (i) and (iii) only
(C) (ii) and (iii) only
(D) All three
17. Arrange $\frac{-3}{4}$, $\frac{-5}{6}$, $\frac{-2}{3}$ and $\frac{-7}{12}$ in **ascending** order.
- (A) $\frac{-5}{6} < \frac{-3}{4} < \frac{-2}{3} < \frac{-7}{12}$
 (B) $\frac{-7}{12} < \frac{-2}{3} < \frac{-3}{4} < \frac{-5}{6}$
 (C) $\frac{-2}{3} < \frac{-5}{6} < \frac{-7}{12} < \frac{-3}{4}$
 (D) $\frac{-3}{4} < \frac{-5}{6} < \frac{-2}{3} < \frac{-7}{12}$
18. A water tank is $\frac{2}{5}$ full. When 24 litres of water are poured in, it becomes $\frac{4}{5}$ full. What is the total capacity of the tank?
- (A) 40 litres
(B) 60 litres
(C) 50 litres
(D) 72 litres

Answer Key

1	A	2	C	3	B	4	D	5	A
6	C	7	D	8	A	9	B	10	C
11	D	12	A	13	B	14	C	15	D
16	B	17	A	18	B				

Solutions

1. **Answer: (A)** $\frac{5}{7}$

The additive inverse of a number is what must be added to it to give 0. Since $\frac{-5}{7} + \frac{5}{7} = 0$, the additive inverse is $\frac{5}{7}$.

2. **Answer: (C)** 0

We need a number x with $x + x = 0$, that is $2x = 0$, so $x = 0$. Indeed $0 + 0 = 0$, and 0 is the only such rational number.

3. **Answer: (B)** 1

The multiplicative identity leaves every number unchanged on multiplication. Since $a \times 1 = a$ for every rational number a , the identity is **1**. (0 is the *additive* identity.)

4. **Answer: (D)** $\frac{-9}{7}$

The reciprocal (multiplicative inverse) is obtained by interchanging the numerator and the denominator, keeping the sign. Check: $\frac{-7}{9} \times \frac{-9}{7} = \frac{63}{63} = 1$. So the reciprocal is $\frac{-9}{7}$.

5. **Answer: (A)** Distributive

This is the distributive property of multiplication over addition. The commutative property is $a + b = b + a$, and the associative property is $(a + b) + c = a + (b + c)$.

6. **Answer: (C)** -3 and -2

$\frac{-11}{4} = -2.75$. On the number line this lies to the left of -2 but to the right of -3, so it lies between **-3 and -2**.

7. **Answer: (D)** $\frac{-4}{7}$

$\frac{2}{3} \times \frac{-6}{7} = \frac{-12}{21}$. Dividing the numerator and denominator by 3 gives $\frac{-4}{7}$.

8. **Answer: (A)** $\frac{-2}{3}$

Dividing means multiplying by the reciprocal:

$$\frac{-5}{8} \div \frac{15}{16} = \frac{-5}{8} \times \frac{16}{15} = \frac{-80}{120} = \frac{-2}{3}.$$

9. **Answer: (B)** Q

$\frac{-5}{4} = -1.25$, which is one quarter to the *left* of -1. Point **Q** is exactly one small division left of -1. (P is $\frac{-9}{4}$, R is $\frac{-3}{4}$ and S is $\frac{1}{2}$.)

10. **Answer: (C)** $\frac{5}{12}$

Write both numbers with denominator 12: $\frac{1}{3} = \frac{4}{12}$ and $\frac{1}{2} = \frac{6}{12}$. The only option lying strictly between $\frac{4}{12}$ and $\frac{6}{12}$ is $\frac{5}{12}$. Checking the others: $\frac{1}{4} = \frac{3}{12}$ is too small, while $\frac{2}{3} = \frac{8}{12}$ and $\frac{7}{12}$ are too large.

11. **Answer: (D)** $\frac{-13}{9}$

$$\text{Other number} = \frac{-7}{9} - \frac{2}{3} = \frac{-7}{9} - \frac{6}{9} = \frac{-13}{9}.$$

$$\text{Check: } \frac{-13}{9} + \frac{6}{9} = \frac{-7}{9} \cdot \checkmark$$

12. Answer: (A) $\frac{7}{11}$

Take $\frac{7}{11}$ common (distributive property):

$$\frac{7}{11} \times \left(\frac{3}{5} + \frac{2}{5} \right) = \frac{7}{11} \times \frac{5}{5} = \frac{7}{11} \times 1 = \frac{7}{11}.$$

13. Answer: (B) $12\frac{3}{4}$ kg

$$25\frac{1}{2} = \frac{51}{2} = \frac{102}{4} \text{ and } 12\frac{3}{4} = \frac{51}{4}.$$

$$\text{Rice left} = \frac{102}{4} - \frac{51}{4} = \frac{51}{4} = 12\frac{3}{4} \text{ kg.}$$

14. Answer: (C) Infinitely many

Between any two distinct rational numbers there are **infinitely many** rational numbers. For example, the mid-point ($\frac{1}{4} + \frac{1}{2}$) $\div 2 = \frac{3}{8}$ lies between them, and the same trick can then be repeated endlessly on each smaller interval.

15. Answer: (D) $2\frac{1}{4}$ m

$$15\frac{3}{4} = \frac{63}{4} \text{ m.}$$

$$\text{Length of each piece} = \frac{63}{4} \div 7 = \frac{63}{4} \times \frac{1}{7} = \frac{9}{4} = 2\frac{1}{4} \text{ m.}$$

16. Answer: (B) (i) and (iii) only

Statement (i) is true — any integer n can be written as $\frac{n}{1}$. Statement (ii) is false; $\frac{1}{2}$ is a rational number but not an integer. Statement (iii) is true; the reciprocal of 0 would have to be $\frac{1}{0}$, which is not defined. Hence **(i) and (iii)**.

17. Answer: (A) $\frac{-5}{6} < \frac{-3}{4} < \frac{-2}{3} < \frac{-7}{12}$

Take the LCM of 4, 6, 3 and 12, which is 12, and rewrite each number:

$$\frac{-3}{4} = \frac{-9}{12}, \frac{-5}{6} = \frac{-10}{12}, \frac{-2}{3} = \frac{-8}{12}, \frac{-7}{12} = \frac{-7}{12}.$$

For negative numbers, the larger the numerator in size, the smaller the number. So $-10 < -9 < -8 < -7$ gives

$$\frac{-5}{6} < \frac{-3}{4} < \frac{-2}{3} < \frac{-7}{12}.$$

18. Answer: (B) 60 litres

The 24 litres fill the gap between $\frac{2}{5}$ and $\frac{4}{5}$ of the tank.

$$\text{Fraction filled by 24 litres} = \frac{4}{5} - \frac{2}{5} = \frac{2}{5}.$$

So $\frac{2}{5}$ of the capacity C is 24 litres:

$$\frac{2}{5} \times C = 24, \text{ giving } C = 24 \times \frac{5}{2} = 60 \text{ litres.}$$

Check: $\frac{2}{5}$ of 60 = 24 L at first, and $24 + 24 = 48$ L, which is $\frac{4}{5}$ of 60. ✓