

3. UNDERSTANDING RATIONAL NUMBERS

①

Class: VII, Mathematics

FOUNDATION: SOLUTIONS

2025-26

TEACHING TASK
TEE MANS

01. $-\frac{5}{2} = -1.6$; $-\frac{3}{2} = -1.5$

clearly $-\frac{5}{2}$, $-\frac{3}{2}$ lies between -2 and -1

Ans: A

02. $\frac{1}{3}$, $-\frac{2}{7}$, $-\frac{4}{3}$

∴ LCM of 3, 7, 3 is 21

$$\frac{7}{21}, \frac{-6}{21}, \frac{-28}{21}$$

clearly Ascending order: $\frac{-28}{21}$, $\frac{-6}{21}$, $\frac{7}{21}$

$$\therefore -\frac{4}{3}, -\frac{2}{7}, \frac{1}{3}$$

Ans: B

$$03. -\frac{25}{35} = -\frac{5}{7} \times \frac{11}{11} = -\frac{55}{77}$$

Ans: B
②

$$04. -\frac{2}{13} - x = \frac{5}{2}$$

$$\Rightarrow x = -\frac{2}{13} - \frac{5}{2}$$

$$= \frac{-4-65}{26} = -\frac{69}{26}$$

Ans: A

$$05. \text{Other Number} = \frac{\left(-\frac{28}{27}\right)}{\left(-\frac{4}{9}\right)} = \frac{-28 \times -9}{27 \times 4} = \frac{7}{3}$$

Ans: B

$$06. 7\frac{2}{3} - \frac{23}{3} \text{ and } 12\frac{3}{4} - \frac{51}{4}$$

$$\text{Cost per unit} = \frac{\left(\frac{51}{4}\right)}{\left(\frac{23}{3}\right)} = \frac{51 \times 3}{4 \times 23} = 1\frac{61}{92}$$

Ans: C

07. Let the two rational nos. be x and y

$$\text{Given } x + y = 12 \rightarrow \textcircled{1}$$

$$xy = 35 \rightarrow \textcircled{2}$$

$$\frac{\textcircled{1}}{\textcircled{2}} \Rightarrow \frac{1}{x} + \frac{1}{y} = \frac{12}{35} =$$

Ans: B

$$08. \frac{-36}{-216} = \frac{1}{6}$$

Ans: B

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$$09. -4\frac{3}{4} + 2\frac{7}{12}$$

$$= -\frac{19}{4} + \frac{31}{12}$$

$$= \frac{-57+31}{12} = -\frac{26}{12} = -\frac{13}{6}$$

Ans: C

$$10. \text{ other Number} = \frac{\left(-\frac{9}{16}\right)}{\left(-\frac{4}{15}\right)} = \frac{9}{16} \times \frac{15}{4} = \frac{135}{64}$$

Ans: C

JEE ADVANCED

~~$$\frac{1}{2} - \frac{3}{4} + \frac{5}{6} - \frac{7}{8}$$~~

$$= \frac{12 - 9 + 10 - 21}{24} =$$

$$04. \frac{1}{2} - \frac{3}{4} + \frac{5}{6} - \frac{7}{8}$$

$$= \frac{12 - 18 + 20 - 21}{24} = \frac{-7}{24} = -\frac{14}{48}$$

Ans: A, C

1 and -1 have their own reciprocal

Ans: B, C

Statement I: Conceptual (True)

Statement II: Conceptual (False)

Ans: C

(4)

Q4. Statement I: $\frac{1}{4} + \frac{1}{2} = \frac{3}{8}$ (True)

Ans: A

Statement II: Conceptual (True)

Q5. Assertion (A): Conceptual (True)

Ans: A

Reason (R): Conceptual (True)

Q6. Assertion (A): $-\frac{2}{3} < -\frac{1}{2}$
 $= -4 < -3$ (True)

Ans: C

Reason (R): Conceptual (False)

Q7. $-\frac{3}{7}, -\frac{3}{2}, -\frac{3}{4}$
 $= -\frac{12}{28}, -\frac{42}{28}, -\frac{21}{28}$
Ascending order: $-\frac{42}{28}, -\frac{21}{28}, -\frac{12}{28}$
 $-\frac{3}{2}, -\frac{3}{4}, -\frac{3}{7}$

Ans: D

Q8. Descending order: $-\frac{3}{7}, -\frac{3}{4}, -\frac{3}{2}$

Ans:

Since $-\frac{3}{7} \times \frac{4}{4}, -\frac{3}{4} \times \frac{7}{7}, -\frac{3}{2} \times \frac{14}{14}$
 $-\frac{12}{28} > -\frac{21}{28} > -\frac{42}{28}$

Ans: A

09

$$\begin{aligned} \text{total income} &= \frac{2}{5} + \frac{1}{10} \\ &= \frac{4+1}{10} = \frac{1}{2} \end{aligned}$$

Ans: $\frac{1}{2}$

10

$$\begin{aligned} \text{total income} &= \frac{1}{2} \\ \text{Expenditure} &= \frac{1}{2} \\ \therefore \text{left unaccounted} &= \frac{1}{2} - \frac{1}{2} = 0 \end{aligned}$$

Ans: 0

11

$$\begin{aligned} -\frac{5}{8} &= \frac{4A}{-32} \\ \Rightarrow A &= -\frac{5}{8} \times -32 = 20 \end{aligned}$$

Ans: 20

12

$$\begin{aligned} \left(\frac{2}{3} + \frac{3}{5} + \frac{7}{12} \right) \text{ hr} &= \frac{111}{60} \text{ hr} \\ &= \frac{111}{60} \times 60 \text{ min} \\ &= 111 \text{ minutes} \end{aligned}$$

Ans: 111

6

$$\text{Additive Invers} = \frac{1}{3}$$

Ans: x, s, p, q

- a) $\frac{1}{2} \rightarrow \frac{3}{11}$
 b) $\frac{3}{11} \rightarrow \frac{2}{11}$
 c) $\frac{2}{11} \rightarrow \frac{9}{2}$
 d) $\frac{9}{2} \rightarrow \frac{1}{2}$

$$\frac{2}{3} \div \frac{6}{24}$$

$$\frac{4}{9} \times \frac{6}{24}$$

$$= \frac{1}{9} \times \frac{3}{2}$$

$$= \frac{1}{6}$$

$$\frac{6}{54} \times \frac{54}{6} = 1$$

Ans: x, s, p, q

$$\frac{1}{4} \times \left(\frac{2}{3} + \frac{1}{3} \right)$$

$$= \frac{1}{4} \times \left(\frac{2+1}{3} \right)$$

$$= \frac{1}{4} \times 1$$

$$= \frac{1}{4}$$

$$\frac{5}{2} \div \left(\frac{2}{1} \times \frac{1}{3} \right)$$

$$= \frac{5}{2} \div \frac{2}{3}$$

$$= \frac{5}{2} \times \frac{3}{2}$$

$$= \frac{15}{4}$$

~~QARE CEND~~



LEARNERS TASK

Q

CUQ's

01. $\frac{-192}{108} = \frac{64}{-36}$

Ans: A

02. $\frac{132}{-428} = \frac{-33}{107}$

Ans: B

03. B) $\frac{15}{36} = \frac{5}{12}$, $\frac{63}{108} = \frac{21}{36} = \frac{7}{12}$
∴ $\frac{15}{36} \neq \frac{63}{108}$

Ans: B

04. $a > b, b > c \Rightarrow a > c$

Ans: B

05. Associative Property

Ans: C

06. All statements are Correct.

Ans: D

07. All statements are Correct

Ans: D

08. $\frac{0}{6} = 0$, neither positive, nor negative

Ans: D

09. $-\frac{13}{3} = -\frac{13}{3} \times \frac{9}{9} = -\frac{117}{27}$

Ans: C

10. $x = 36$

Ans: A

JEET MAINS

8

01. $-\frac{5}{6} + (-1\frac{3}{5}) = -\frac{5}{6} - \frac{8}{5}$
 $= \frac{-25-48}{30} = \frac{-73}{30}$

$$2\frac{2}{3} + (-6\frac{2}{5}) = \frac{8}{3} - \frac{32}{5}$$
$$= \frac{40-96}{15} = \frac{-56}{15}$$

Ans: $(\frac{-56}{15}) - (\frac{-73}{30})$
 $= \frac{-112+73}{30} = \frac{-39}{30} = \frac{-13}{10}$

Ans: A

02.

$$(\frac{3}{7} \times -\frac{5}{8}) \div (\frac{1}{3} \times \frac{5}{6}) + (\frac{1}{2} + \frac{1}{5})$$

$$= \frac{-15}{56} \div (\frac{5}{18}) + (\frac{7}{10})$$

$$= \frac{-15}{56} \div (\frac{25+63}{90})$$

$$= \frac{-15}{56} \times \frac{90}{88}$$

$$= \frac{-675}{2464}$$

Ans: —

9

03.

$$\frac{2}{9} \times \frac{27}{24} = \frac{3}{4}$$

03

$$\frac{2}{9} \times \frac{27}{8} = \frac{3}{4}$$

Ans: B

04.

$$\begin{aligned} & \left(-\frac{7}{8}\right) - \left(-\frac{5}{6}\right) \\ &= -\frac{7}{8} + \frac{5}{6} \\ &= \frac{-21 + 20}{24} = -\frac{1}{24} \end{aligned}$$

Ans: A

05.

$$-\frac{2}{3}, \frac{4}{5}, \frac{6}{7} \text{ and } -\frac{1}{6}$$

Short cut method

$$-\frac{2}{3} = -0.666$$

$$\frac{4}{5} = 0.8$$

$$\frac{6}{7} = 0.85$$

$$-\frac{1}{6} = -0.16$$

clearly

$$-0.16 < -0.666 < 0.8 < 0.85$$

$$-\frac{1}{6} < -\frac{2}{3} < \frac{4}{5} < \frac{6}{7}$$

Ans: B

06.

$$-\frac{2}{3} \times \frac{6}{6} = -\frac{12}{18} \quad -1 = -\frac{1}{1} \times 18 = -\frac{18}{18}$$

$$\text{clearly } -\frac{13}{18}, -\frac{14}{18}, -\frac{15}{18}, -\frac{16}{18}, -\frac{17}{18} \text{ and } -1$$

in b/w $-\frac{2}{3}$ and -1

Ans: B

(10)

$$\frac{5}{7} \times x = \frac{10}{7}$$

$$\Rightarrow x = 2$$

Ans: A

$$08. \quad -\frac{1}{3} = -\frac{1}{3} \times \frac{3}{3} = -\frac{1}{9}, \quad -\frac{4}{3} = -\frac{4}{3} \times \frac{3}{3} = -\frac{12}{9}$$

and $-\frac{2}{9}$.

$$\text{clearly } -\frac{2}{9} > -\frac{3}{9} > -\frac{12}{9}$$

$$\Rightarrow -\frac{2}{9} > -\frac{1}{3} > -\frac{4}{3}$$

Ans: A

$$09. \quad -\frac{17}{18} \times (-3) \times \frac{108}{30}$$

$$= \frac{51}{5}$$

Ans: B

$$10. \quad \text{Total} = 3\frac{1}{2} + \frac{5}{6} + \frac{3}{4}$$

$$= \frac{7}{2} + \frac{5}{6} + \frac{3}{4}$$

$$= \frac{42 + 10 + 9}{12} = \frac{61}{12} = 5\frac{1}{2} \text{ kg}$$

Ans: D

ADVANCED

1. B) and C) are correct

Ans: B, C

2. A, B, C are correct

Ans: A, B, C

(11)

03. Statement I: Conceptual (True)Statement II: Conceptual (False) Ans: C04. Statement I: Conceptual (False)Statement II: Conceptual (True) Ans: D05. Assertion: Conceptual (True)Reason: Conceptual (True) Ans: A06. Assertion: Conceptual (True) Ans: AReason: Conceptual (True) ~~Ans:~~ .

$$07. \quad p = -6\frac{1}{6} = -\frac{37}{6}, \quad q = -8\frac{1}{8} = -\frac{65}{8}$$

$$\begin{aligned}
 p+q &= -\frac{37}{6} - \frac{65}{8} \\
 &= \frac{-148 - 195}{24} \\
 &= \frac{-343}{24} \\
 &= -14\frac{7}{24}
 \end{aligned}$$

Ans: B

08

$$6p - 8q = 6\left(-\frac{37}{6}\right) = -37$$

$$8q = 8\left(-\frac{65}{8}\right) = -65$$

$$\therefore 6p - 8q = -37 + 65 =$$

~~102~~ 28

Ans: B

(12)

09.

$$-\frac{5}{6} \times \frac{3}{10} = -\frac{1}{4}$$

Ans: A

10. yes

Ans: A

11.

$$\text{No. of pizzas} = \frac{90}{\left(2\frac{1}{4}\right)} = \frac{90}{\left(\frac{9}{4}\right)} = 40.$$

Ans: 40

12.

$$\frac{1}{4} = \frac{1}{4} \times \frac{3}{3} = \frac{3}{12}$$

$$\frac{2}{3} = \frac{2}{3} \times \frac{4}{4} = \frac{8}{12}$$

$$\text{Now, } \frac{3}{12}, \frac{4}{12}, \frac{5}{12}, \frac{6}{12}, \frac{7}{12}, \frac{8}{12}$$

Ans: 4

13

$$a) \frac{22}{-42} = \frac{-22}{42} = -\frac{11}{21}$$

$$b) \frac{-12}{-21} = \frac{12}{21}$$

$$c) \frac{27}{30} = \frac{9}{10}$$

$$d) \frac{-32}{56} = -\frac{4}{7}$$

Ans: 0, -, -, -

14

$$a) \frac{9}{4} + \frac{1}{4} = \frac{3+1}{4} = \frac{4}{4} = 1$$

$$b) \frac{7}{8} - \frac{3}{8} = \frac{7-3}{8} = \frac{4}{8}, \text{ Numerator} = 5$$

$$c) \frac{2}{3} \times \frac{3}{2} = 1$$

$$d) \frac{6}{7} \div \frac{2}{7} = \frac{6}{7} \times \frac{7}{2} = 3.$$

Ans: +, +, +, +

$\Rightarrow$ THE END $\Leftarrow$