➤ **Choose The Right Answer From The Given Options.[1 Marks Each]** **[10]**

1. Which of the following is the product of $\left(-\frac{7}{8}\right)$ and $\frac{4}{21}$?

   (A) $-\frac{1}{6}$        (B) $12$        (C) $-\frac{63}{16}$        (D) $-\frac{16}{147}$

   **Ans. :**

      a.    $-\frac{1}{6}$

        **Solution:**

        Simply multiply the numerators and denominators separately:

        $= -\frac{7}{8} \times \frac{4}{21}$

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

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

2. Mark ($\checkmark$) against the correct answer of the following:

   A rational number between $\frac{-2}{3}$ and $\frac{1}{2}$ is:

   (A) $\frac{-1}{6}$        (B) $\frac{-1}{12}$        (C) $\frac{-5}{6}$        (D) $\frac{5}{6}$

   **Ans. :**

      b.    $\frac{-1}{12}$

        **Solution:**

        A rational number between $\frac{-2}{3}$ and $\frac{1}{2} = \frac{1}{2} \times \left(\frac{-2}{3} + \frac{1}{2}\right)$

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

        $= \frac{1}{2} \times \left(\frac{-4}{6} + \frac{3}{6}\right)$

        $= \frac{1}{2} \times \left(\frac{-4+3}{6}\right)$

        $= \frac{-1}{12}$

3. Which of the following is not true?

   (A) Rational numbers are closed under addition.

   (B) Rational numbers are closed under subtraction.

   (C) Rational numbers are closed under multiplication.

   (D) Rational numbers are closed under division.

   **Ans. :**

      d.    Rational numbers are closed under division.

        **Solution:**

        Rational numbers are not not closed under division.

        As, 1 and 0 are the rational number but $\frac{1}{0}$ is not defined.

4. Tick (✓) the correct answer the following:

What should be added to $\frac{-5}{7}$ to get $\frac{-2}{3}$?

(A) $\frac{-29}{21}$        (B) $\frac{29}{21}$        (C) $\frac{1}{21}$        (D) $\frac{-1}{21}$

**Ans. :**

    c.    $\frac{1}{21}$

    **Solution:**

$$= \frac{-2}{3} - \left(\frac{-5}{7}\right)$$
$$= \frac{-2}{3} + \frac{5}{7}$$
$$= \frac{-14+15}{21}$$
$$= \frac{1}{21}$$

5. Tick (✓) the correct answer the following:

The sum of two rational numbers is -3. If one of them is $\frac{-10}{3}$ then the other one is:

(A) $\frac{-13}{3}$        (B) $\frac{-19}{3}$        (C) $\frac{1}{3}$        (D) $\frac{13}{3}$

**Ans. :**

    c.    $\frac{1}{3}$

    **Solution:**

    Sum = -3

    One number $= \frac{-10}{3}$

    $\therefore$ Second number $= -3 - \left(\frac{-10}{3}\right)$

$$= -3 + \frac{10}{3}$$
$$= \frac{-9+10}{3}$$
$$= \frac{1}{3}$$

6. Find the multiplicative inverse of $\frac{1}{4}$.

(A) 4        (B) $\frac{-1}{4}$        (C) -4        (D) $\frac{1}{4}$

**Ans. :**

    a.    4

7. Find the reciprocal of -2.

(A) 2        (B) -2        (C) $\frac{-1}{2}$        (D) None of these

**Ans. :**

    c.    $\frac{-1}{2}$

8. Which of the following statements is true?

(A) Natural numbers are not associative for multiplication.

(B) Whole numbers are not associative for multiplication.

(C) Integers are associative for multiplication.

(D) Rational numbers are not associative for multiplication.

**Ans. :**

    c.    Integers are associative for multiplication.

9. A number of the form $\frac{p}{q}$ is said to be a rational number if:

(A) p and q are integers.

(B) p and q are integers and $q \neq 0$

(C) p and q are integers and $p \neq 0$

(D) p and q are integers and $p \neq 0$ also $q \neq 0$

**Ans. :**

    b.    p and q are integers and $q \neq 0$.

    **Solution:**

    A number of the form $\frac{p}{q}$ is said to be a rational number, if p and q are integers.

10. Which number is in the middle if $\frac{-1}{6}$, $\frac{4}{9}$, $\frac{6}{-7}$, $\frac{2}{5}$ and $\frac{-3}{4}$ arranged in descending order?

(A) $\frac{2}{5}$           (B) $\frac{4}{9}$           (C) $\frac{-1}{6}$           (D) $\frac{-6}{7}$

**Ans. :**

    c.    $\frac{-1}{6}$

➤ **Questions With Calculation.[2 Marks Each]**         **[8]**

11. Divide the sum of $\frac{13}{5}$ and $\frac{-12}{7}$ by the product of $\frac{-31}{7}$ and $\frac{1}{-2}$.

**Ans. :**

Sum of $\frac{13}{5}$ and $\frac{-12}{7}$

$= \frac{13}{5} + \frac{-12}{7}$

$= \frac{91+(-60)}{35}$

$= \frac{91-60}{35}$

$= \frac{31}{35}$

Now, product of $\frac{-31}{7}$ and $\frac{1}{-2}$

$= \frac{-31}{7} \times \frac{1}{-2}$

$= \frac{-31}{-14} = \frac{31}{14}$

$\therefore \frac{-31}{-14} \div \frac{31}{14}$

$= \frac{31}{35} \times \frac{14}{31}$

$= \frac{14}{35}$

$= \frac{14 \div 7}{35 \div 7}$

$= \frac{2}{5}$

$\therefore$ Required number $= \frac{2}{5}$

12. Find three rational numbers between 4 and 5.

**Ans. :** First rational number between 4 and $5 = \frac{1}{2}[4+5] = \frac{1}{2} \times 9 = \frac{9}{2}$ $\therefore 4 < \frac{9}{2} < 5$

Second rational number between 4 and $\frac{9}{2}$

$= \frac{1}{2}\left[4 + \frac{9}{2}\right] = \frac{1}{2}\left[\frac{8+9}{2}\right] = \frac{1}{2} \times \frac{17}{2} = \frac{17}{4}$

and third rational number between $\frac{9}{2}$ and 5

$= \frac{1}{2}\left[\frac{9}{2} + 5\right] = \frac{1}{2}\left[\frac{9+10}{2}\right] = \frac{1}{2} \times \frac{19}{2} = \frac{19}{4}$ $\therefore 4 < \frac{17}{4} < \frac{9}{2} < \frac{19}{4} < 5$ $\therefore$ Required three rational numbers and $\frac{17}{4}, \frac{9}{2}, \frac{19}{4}$

13. Find the cost of $3\frac{2}{5}$ metres of cloth at Rs. $63\frac{3}{4}$ per metre.

**Ans. :** Cost of 1m cloth $= \text{Rs. } 63\frac{3}{4} = \frac{4 \times 63 + 3}{4} = \text{Rs. } \frac{255}{4}$ $\therefore$ Cost of $3\frac{2}{5}\text{m} = \text{Rs. } \frac{255}{4} \times \frac{17}{5}$

$= \text{Rs. } \frac{255 \times 17}{4 \times 5} = \frac{51 \times 17}{4} = \text{Rs. } \frac{867}{4} = \text{Rs. } 216\frac{3}{4}$

14. If $\frac{3}{5}$ of a number exceeds its $\frac{2}{7}$ by 44, find the number.

**Ans. :**

Let number = 1

Then difference between $\frac{3}{5}$ and $\frac{2}{7}$

$= \frac{3}{5} - \frac{2}{7}$

$= \frac{21 - 10}{35}$

$= \frac{11}{35}$

$\therefore \frac{11}{35}$ of a number = 44

$\therefore$ Number $= 44 \div \frac{11}{35}$

$= 44 \times \frac{35}{11}$

$= \frac{1540}{11}$

$= 140$

➤ **Questions With Calculation.[3 Marks Each]** [12]

15. Roller Coaster at an amusement park is $\frac{2}{3}\text{m}$ high. If a new roller coaster is built that is $\frac{3}{5}$ times the height of the existing coaster, what will be the height of the new roller coaster?

**Ans. :** Given, height of the existing roller coaster $= \frac{2}{3}\text{m}$ Height of new roller coaster $= \frac{3}{5}$ of height of the existing roller coaster $= \frac{3}{5} \times \frac{2}{3} = \frac{2}{5}\text{m}$

16. Simplify:

$\left(\frac{3}{11} \times \frac{5}{6}\right) - \left(\frac{9}{12} \times \frac{4}{3}\right) + \left(\frac{5}{13} \times \frac{6}{15}\right)$

**Ans. :** $\left(\frac{3}{11} \times \frac{5}{6}\right) - \left(\frac{9}{12} \times \frac{4}{3}\right) + \left(\frac{5}{13} \times \frac{6}{15}\right)$ $= \frac{3 \times 5}{11 \times 6} - \frac{9 \times 4}{12 \times 3} + \frac{5 \times 6}{13 \times 15}$ $= \frac{1 \times 5}{11 \times 2} - \frac{3 \times 1}{3} + \frac{1 \times 2}{13 \times 1}$

$= \frac{5}{22} - 1 + \frac{2}{13}$ $= \frac{65 - 286 + 44}{286}$ (LCM of 22, 13 = 286) $= \frac{109 - 286}{286} = \frac{-177}{286}$

17. On one day a rickshaw puller earned Rs. 160. Out of his earnings he spent Rs. $26\frac{3}{5}$ on tea and snacks, Rs. $50\frac{1}{2}$ on food and Rs. $16\frac{2}{5}$ on repairs of the rickshaw. How much did he save on that day?

    **Ans. :**

    Total earnings $= $ Rs. 160

    Spent on tea and snacks $= $ Rs. $26\frac{3}{5}$

    $= $ Rs. $\frac{133}{5}$

    Spent on food $= $ Rs. $50\frac{1}{2}$

    $= $ Rs. $\frac{101}{2}$

    Spent on repair of rickshaw $= $ Rs. $16\frac{2}{5}$

    $= $ Rs. $\frac{82}{5}$

    Total amount spent $= $ Rs. $\frac{133}{5} + \frac{101}{2} + \frac{82}{5}$

    $= \frac{266 + 505 + 164}{10}$

    $= $ Rs. $\frac{935}{10}$

    $\therefore$ Savings $= $ Rs. $160 - \frac{935}{10}$

    $= \frac{1600 - 935}{10}$

    $= \frac{665}{10}$

    $= \frac{665 \div 5}{10 \div 5}$

    $= \frac{133}{2}$

    $= $ Rs. $66\frac{1}{2}$

18. State which property is in the following and verify it.

    (i) $\frac{19}{50} \times \left(\frac{50}{38} \times \frac{5}{19}\right) = \left(\frac{19}{50} \times \frac{50}{38}\right) \times \frac{5}{19}$

    (ii) $\frac{-6}{5} + \left\{\frac{2}{15} + \left(\frac{-9}{25}\right)\right\} = \left\{\left(\frac{-6}{5}\right) + \frac{2}{15}\right\} + \left(\frac{-9}{25}\right)$

    (iii) $\frac{6}{19} \times \left\{\frac{4}{15} - \frac{2}{5}\right\} = \frac{6}{19} \times \frac{4}{15} - \frac{6}{19} \times \frac{2}{5}$

    **Ans. :** (i) $\frac{19}{50} \times \left(\frac{50}{38} \times \frac{5}{19}\right) = \left(\frac{19}{50} \times \frac{50}{38}\right) \times \frac{5}{19}$

    This statement follow associative property undet multiplication

    LHS $= \frac{19}{50} \times \left(\frac{50}{38} \times \frac{5}{19}\right) = \frac{19}{50} \times \frac{50 \times 5}{38 \times 19} = \frac{5}{38}$

    RHS $= \left(\frac{19}{50} \times \frac{50}{38}\right) \times \frac{5}{19} = \frac{1}{2} \times \frac{5}{19} = \frac{5}{38}$

    (ii) $\frac{-6}{5} + \left[\frac{2}{5} + \left(\frac{-9}{25}\right)\right] = \left[\left(\frac{-6}{5}\right) + \frac{2}{5}\right] + \left(\frac{-9}{25}\right)$

    This statement follow associative property under addition.

    LHS $= \frac{-6}{5} + \left[\frac{2}{5} + \left(\frac{-9}{25}\right)\right]$

    $= \frac{-6}{5} + \left(\frac{2}{5} - \frac{9}{25}\right) = \frac{-6}{5} + \left(\frac{10 - 9}{25}\right) = \frac{-6}{5} + \frac{1}{25}$

$= \frac{-6}{5} + \frac{1}{25} = \frac{-30+1}{25} = \frac{-29}{25}$

RHS $= \left[ \left( \frac{-6}{5} \right) + \frac{2}{5} \right] + \left( \frac{-9}{25} \right)$

$= \left( \frac{-6}{5} + \frac{2}{5} \right) - \frac{9}{25} = \frac{-4}{5} - \frac{9}{25} = \frac{-20-9}{25} = \frac{-29}{25}$

(iii) $\frac{6}{19} \times \left( \frac{4}{15} - \frac{2}{5} \right) = \frac{6}{19} \times \frac{4}{15} - \frac{6}{19} \times \frac{2}{5}$

This statement follow distributive property over subtraction.

LHS $= \frac{6}{19} \times \left( \frac{4}{15} - \frac{2}{5} \right)$

$= \frac{6}{19} \times \left( \frac{4-6}{15} \right) = \frac{6}{19} \times \frac{(-2)}{15} = \frac{2 \times (-2)}{19 \times 5} = \frac{-4}{95}$

RHS $= \frac{6}{19} \times \frac{4}{15} - \frac{6}{19} \times \frac{2}{5}$

$= \frac{8}{95} - \frac{12}{95} = \frac{8-12}{95} = \frac{-4}{95}$

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