

Exercises - 4A

Q. 1 Answer :

The numbers that are the form of $\frac{p}{q}$, where p and q are integers and $q \neq 0$, are called rational number.

Five Positive rational numbers :

$$\frac{5}{7}, \frac{-3}{-4}, \frac{7}{8}, \frac{-14}{-15}, \frac{5}{9}$$

Five Negative rational numbers :

$$\frac{-3}{7}, \frac{-3}{8}, \frac{8}{-9}, \frac{-19}{25}, \frac{8}{-25}$$

Q. 3 Answer :

(i) $\frac{8}{19}$

Numerator = 8

Denominator = 19

(ii) $\frac{5}{-8}$

Numerator = 5

Denominator = -8

(iii) $\frac{-13}{8}$

Numerator = -13

Denominator = 5

Q. 4 Answer :

(i) 5

The rational number will be $\frac{5}{1}$

Numerator = 5

Denominator = 1

(ii) -3

The rational number will be $\frac{-3}{1}$

Numerator = -3

Denominator = 1

(iii) 1

The rational number will be $\frac{1}{1}$

Numerator = 1

Denominator = 1

Q. 5 Answer :

Positive rational numbers :

(iii) $\frac{-5}{-8}$

(iv) $\frac{37}{53}$

(vi) 8 because 8 can be written $\frac{8}{1}$, where $1 \neq 0$

0 is neither positive nor negative.

Q. 6 Answer : Negative rational numbers :

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

(iv) $\frac{4}{-9}$

(v) -6

(vi) $\frac{1}{-2}$

Q. 7 Answer :

(i) Following are the four rational numbers that are equivalent to $\frac{6}{12}$

$\frac{6 \times 2}{11 \times 2}, \frac{6 \times 3}{11 \times 3}, \frac{6 \times 4}{11 \times 4}$ and $\frac{6 \times 5}{11 \times 5}$

i.e. $\frac{12}{22}, \frac{18}{33}, \frac{24}{44}$ and $\frac{30}{55}$

(ii) Following are the four rational numbers that are equivalent to $\frac{-3}{8}$

$\frac{-3 \times 2}{8 \times 2}, \frac{-3 \times 3}{8 \times 3}, \frac{-3 \times 4}{8 \times 4}$ and $\frac{-3 \times 5}{8 \times 5}$

i.e. $\frac{-6}{16}, \frac{-9}{24}, \frac{-12}{32}$ and $\frac{-15}{40}$

(iii) Following are the four rational numbers that are equivalent to $\frac{7}{-15}$

$\frac{7 \times 2}{-15 \times 2}, \frac{7 \times 3}{-15 \times 3}, \frac{7 \times 4}{-15 \times 4}$ and $\frac{7 \times 5}{-15 \times 5}$

(iv) Following are the four rational numbers that are equivalent to $\frac{8}{1}$

$\frac{8 \times 2}{1 \times 2}, \frac{8 \times 3}{1 \times 3}, \frac{8 \times 4}{1 \times 4}$ and $\frac{8 \times 5}{1 \times 5}$

i.e. $\frac{16}{2}, \frac{24}{3}, \frac{32}{4}$ and $\frac{40}{5}$

Q. 8 Answer :

(i) $\frac{12 \times (-1)}{(-17) \times (-1)} = \frac{-12}{17}$

(ii) $\frac{1 \times (-1)}{(-2) \times (-1)} = \frac{-1}{2}$

(iii) $\frac{-8}{-19} = \frac{-8 \times (-1)}{(-19) \times (-1)} = \frac{8}{19}$

(iv) $\frac{11 \times (-1)}{-6 \times (-1)} = \frac{-11}{6}$

Q. 9 Answer :

(i) Numerator of $\frac{5}{8}$ is 5

5 should be multiplied by 3 to get 15.

Multiplying both the numerator and the denominator by 3

$$\frac{5 \times 3}{8 \times 3} = \frac{15}{24}$$

$$\frac{5}{8} = \frac{15}{24}$$

- (ii) Numerator of $\frac{5}{8}$ is 5

5 should be multiplied by -2 to get -10.

Multiplying both the numerator and the denominator by -2

$$\frac{5 \times (-2)}{8 \times (-2)} = \frac{-10}{-16}$$

$$\frac{5}{8} = \frac{-10}{-16}$$

Exercises – 4B

Q. 1 Answer :

- (i) $\frac{5}{6}$ This is because 0 can be written as $\frac{0}{6}$ and $\frac{0}{6} < \frac{5}{6}$.

- (ii) $\frac{-3}{5}$ This is because 0 can be written as $\frac{0}{5}$ and $-3 < 0$.

- (iii) $\frac{5}{8} > \frac{3}{8}$ This is because $5 > 3$

- (iv) $\frac{7}{9} > \frac{5}{9}$ This is because $7 > 5$

Q. 2 Answer :

- (i) $\frac{5}{9}, \frac{-3}{-8}$

$$\frac{(-3) \times (-1)}{(-8) \times (-1)} = \frac{3}{8}$$

L.C.M. of 9 and 8 is 72

$$\frac{5 \times 8}{9 \times 8} = \frac{27}{72}$$

$$\frac{3 \times 9}{8 \times 9} = \frac{27}{72}$$

$$27 < 40$$

$$\frac{-3}{-8} < \frac{5}{9}$$

So, $\frac{5}{9}$ is greater.

- (ii) $\frac{4}{-3}, \frac{-8}{7}$

We will convert each negative denominator into positive.

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

L.C.M. of 3 and 7 is 21

$$\frac{-4 \times (7)}{(3) \times (7)} = \frac{28}{21}$$

$$\frac{(-8) \times 3}{7 \times 3} = \frac{24}{21}$$

$$(-24) > (-28)$$

$$\frac{-8}{7} > \frac{4}{(-3)}$$

So, is $\frac{-8}{7}$ greater.

(iii) $\frac{-12}{5}, -3$

L.C.M. of 5 and 1 is 5.

$$\frac{12 \times 1}{5 \times 1} = \frac{12}{5}$$

$$\frac{3 \times 5}{1 \times 5} = \frac{15}{5}$$

$$-12 > -15$$

$$\frac{-12}{5} > -3$$

So, is $\frac{-12}{5}$ greater.

(iv) $\frac{-7}{9}, \frac{-5}{8}$

L.C.M. of 9 and 8 is 72

$$\frac{-7 \times 8}{9 \times 8} = \frac{-56}{72}$$

$$\frac{-5 \times 9}{8 \times 9} = \frac{-45}{72}$$

$$-56 < -45$$

$$\frac{-7}{9} < \frac{5}{-8}$$

So, is $\frac{-8}{7}$ greater.

Q. 4 Answer :

(i) $\frac{-3}{7} > \frac{-6}{13}$

L.C.M. of 7 and 13 is 91

$$\frac{-3 \times 13}{7 \times 13} = \frac{-39}{91}$$

$$\frac{-6 \times 7}{13 \times 7} = \frac{-42}{91}$$

$$\frac{-39}{91} > \frac{-42}{91}$$

(ii) $\frac{5}{-13}, \frac{-35}{91}$

L.C.M. of 13 and 91 is 91

$$\frac{5 \times (-7)}{-13 \times (-7)} = \frac{-35}{91}$$

(iii) $-2 > \frac{-13}{5}$

L.C.M. of 1 and 5 is 5

$$\frac{-2 \times 5}{1 \times 5} = \frac{-10}{5}$$

$$\frac{-13 \times 1}{5 \times 1} = \frac{-13}{5}$$

$$\frac{-10}{5} > \frac{-13}{5}$$

(iv) $\frac{-2}{3} < \frac{-5}{6}$

L.C.M. of 8 and 3 is 24.

$$\frac{-2 \times 8}{3 \times 8} = \frac{-16}{24}$$

$$\frac{-5 \times 3}{8 \times 3} = \frac{-15}{24}$$

$$\frac{-16}{24} < \frac{-15}{24}$$

(v) $0 > \frac{3}{5}$

L.C.M. of 8 and 3 is 24

$$\frac{-2 \times 8}{3 \times 8} = \frac{-16}{24}$$

$$\frac{-5 \times 3}{8 \times 3} = \frac{-15}{24}$$

$$\frac{-16}{24} > \frac{-15}{24}$$

Q. 5 Answer :

(i) $\frac{2}{5}, \frac{7}{10}, \frac{8}{15}, \frac{13}{30}$

L.C.M. of 5, 10, 15 and 30 is 30

$$\begin{array}{l|l} 5 & 5, 10, 15, 30 \end{array}$$

$$\begin{array}{l|l} 2 & 1, 2, 3, 6 \end{array}$$

$$\begin{array}{l|l} 3 & 1, 1, 3, 3 \end{array}$$

$$\begin{array}{l|l} & 1, 1, 1, 1 \end{array}$$

$$\frac{2 \times 6}{5 \times 6} = \frac{12}{30}$$

$$\frac{7 \times 3}{10 \times 3} = \frac{21}{30}$$

$$\frac{8 \times 2}{15 \times 2} = \frac{16}{30}$$

$$\frac{13 \times 1}{30 \times 1} = \frac{13}{30}$$

$$\frac{13 \times 1}{30 \times 1} = \frac{13}{30}$$

Required order : $\frac{2}{5} < \frac{13}{30} < \frac{8}{15} < \frac{7}{10}$

(ii) $\frac{-3}{4}, \frac{5}{-12}, \frac{-7}{16}, \frac{9}{-24}$

First we need to convert each negative denominators into positive.

$$\frac{-3}{4}, \frac{5 \times}{-12 \times -1}, \frac{-7}{16}, \frac{9 \times 1}{-24 \times -1}$$

$$\frac{-3}{4}, \frac{-5}{12}, \frac{-7}{16}, \frac{-9}{24}$$

$$\begin{array}{l|l} 2 & 4, 12, 16, 24 \end{array}$$

$$\begin{array}{l|l} 2 & 2, 6, 8, 12 \end{array}$$

$$\begin{array}{l|l} 2 & 1, 3, 4, 6 \end{array}$$

$$\begin{array}{l|l} 2 & 1, 3, 2, 3 \end{array}$$

$$\begin{array}{l|l} 3 & 1, 3, 1, 3 \end{array}$$

$$1, 1, 1, 1$$

L.C.M. of 4, 12, 16 and 24 is 48

$$\frac{-3 \times 12}{4 \times 12} = \frac{-36}{48}$$

$$\frac{-5 \times 4}{15 \times 4} = \frac{-20}{60}$$

$$\frac{-7 \times 3}{16 \times 3} = \frac{-21}{48}$$

$$\frac{-9 \times 18}{24 \times 2} = \frac{-18}{48}$$

$$\text{Required order : } \frac{-3}{4} < \frac{-7}{16} < \frac{-5}{12} < \frac{-9}{24}$$

(iii) $\frac{-3}{10}, \frac{7}{-15}, \frac{-11}{20}, \frac{17}{-30}$

First we need to convert each negative denominators into positive.

$$\frac{-3}{10}, \frac{7 \times -1}{-15 \times -1}, \frac{-11}{20}, \frac{17 \times -1}{-30 \times -1}$$

$$\frac{-3}{10}, \frac{-7}{15}, \frac{-11}{20}, \frac{-17}{30}$$

$$\begin{array}{l|l} 5 & 10, 15, 20, 30 \end{array}$$

$$\begin{array}{l|l} 2 & 2, 3, 4, 6 \end{array}$$

$$\begin{array}{l|l} 3 & 1, 3, 2, 3 \end{array}$$

$$\begin{array}{l|l} 3 & 1, 3, 1, 3 \end{array}$$

$$\begin{array}{l|l} & 1, 1, 1, 1 \end{array}$$

L.C.M. of 10, 15, 20, 30 = 60

$$\frac{-3 \times 6}{10 \times 6} = \frac{-18}{60}$$

$$\frac{-7 \times 4}{15 \times 4} = \frac{-28}{60}$$

$$\frac{-11 \times 3}{20 \times 3} = \frac{-33}{60}$$

$$\frac{-17 \times 2}{30 \times 2} = \frac{-34}{60}$$

$$\text{Therefore : } \frac{-34}{60} < \frac{-33}{60} < \frac{-28}{60} < \frac{-18}{60}$$

$$\text{i.e. } \frac{-17}{30} < \frac{-11}{20} < \frac{-7}{15} < \frac{-6}{10}$$

Q. 6 Answer :

(i) $\frac{-2}{5}, \frac{7}{-10}, \frac{-11}{15}, \frac{19}{-30}$

First, we need to convert each negative denomination into positive.

$$\frac{-2}{5}, \frac{7 \times -1}{-10 \times -1}, \frac{-11}{15}, \frac{19 \times -1}{-30 \times -1}$$

$$\frac{-2}{5}, \frac{-7}{10}, \frac{-11}{15}, \frac{-19}{30}$$

$$\begin{array}{l|l} 5 & 5, 10, 15, 30 \end{array}$$

$$\begin{array}{l|l} 2 & 1, 2, 3, 6 \end{array}$$

$$\begin{array}{l|l} 3 & 1, 1, 3, 3 \end{array}$$

$$\begin{array}{l|l} & 1, 1, 1, 1 \end{array}$$

L.C.M. of 5, 10, 15, 30 is 30.

$$\frac{-2 \times 6}{5 \times 6} = \frac{-12}{30}$$

$$\frac{-7 \times 3}{10 \times 3} = \frac{-21}{30}$$

$$\frac{-11 \times 2}{15 \times 2} = \frac{-22}{30}$$

$$\frac{-19 \times 1}{30 \times 1} = \frac{-19}{30}$$

$$\text{Correct order : } \frac{-2}{5} > \frac{19}{-30} > \frac{7}{-10} > \frac{-11}{15}$$

(ii) $-2, \frac{-13}{6}, \frac{8}{-2}, \frac{1}{3}$

First, we need to convert each negative denomination into positive.

$$-2, \frac{-13}{6}, \frac{8 \times -1}{-3 \times -1}, \frac{1}{3}$$

$$-2, \frac{-13}{6}, \frac{-8}{3}, \frac{1}{3}$$

3	1, 6, 3, 3
2	1, 2, 1, 1
	1, 1, 1, 1

L.C.M. of 6, 3 and 3 is 6.

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

$$\frac{-13 \times 1}{6 \times 1} = \frac{-13}{6}$$

$$\frac{-8 \times 2}{3 \times 2} = \frac{-16}{6}$$

$$\frac{1 \times 2}{3 \times 2} = \frac{2}{6}$$

$$\text{Correct order : } \frac{1}{3} > -2 > \frac{-13}{6} > \frac{-8}{3}$$

(iii) $\frac{-4}{5}, \frac{5}{-12}, \frac{-7}{18}, \frac{2}{-3}$

First, we need to convert each negative denomination into positive.

$$\frac{-4}{9}, \frac{5 \times -1}{-12 \times -1}, \frac{-7}{18}, \frac{2 \times -1}{-3 \times -1}$$

$$\frac{-4}{9}, \frac{-5}{12}, \frac{-7}{18}, \frac{-2}{3}$$

3	9, 12, 18, 3
3	3, 4, 6, 1
2	1, 2, 1, 1
2	1, 2, 1, 1
	1, 1, 1, 1

L.C.M. of 9, 12, 18 and 3 is 36.

$$\frac{-4 \times 4}{9 \times 4} = \frac{-16}{36}$$

$$\frac{-5 \times 3}{12 \times 3} = \frac{-15}{36}$$

$$\frac{-7 \times 2}{18 \times 2} = \frac{-14}{36}$$

$$\frac{-2 \times 12}{3 \times 12} = \frac{-24}{36}$$

$$\text{Correct order : } \frac{-7}{18} > \frac{-5}{12} > \frac{-4}{9} > \frac{-2}{3}$$

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Exercises – 4C

Rational Numbers

Q. 1 Answer :

(i) $\frac{12}{7} + \frac{3}{7} = \frac{12+3}{7} = \frac{15}{7}$

(ii) $\frac{-2}{5} + \frac{1}{5} = \frac{-2+1}{5} = \frac{-1}{5}$

(iii) $\frac{3}{-5} \times \frac{-1}{-1} = \frac{-3}{8}$

$$\frac{-3}{8} + \frac{1}{8} = \frac{-3+1}{8} = \frac{-2}{8}$$

(vi) $\frac{7}{-11} \times \frac{-1}{-1} = \frac{-7}{11}$

$$\frac{-5}{11} + \frac{-7}{11} = \frac{5+(-7)}{11} = \frac{-5-7}{11} = \frac{-12}{11}$$

Q. 2 Answer :

(i) $\frac{-2}{5} + \frac{3}{4}$

The denominators of the given rational numbers are 5 and 4

L.C.M. of 5 and 4 is 20.

$$\frac{-2}{5} = \frac{(-2) \times 4}{5 \times 4} = \frac{-8}{20}$$

$$\frac{3}{4} = \frac{3 \times 5}{4 \times 5} = \frac{15}{20}$$

$$\text{Now, } \frac{(-8)}{20} + \frac{15}{20} = \frac{-8+15}{20} = \frac{7}{20}$$

(ii) $\frac{-5}{9} + \frac{2}{3}$

The denominators of the given rational numbers are 9 and 3.

L.C.M. of 9 and 3 is 9.

$$\frac{-5}{9} = \frac{(-5) \times 1}{9 \times 1} = \frac{-5}{9}$$

$$\frac{2}{3} = \frac{2 \times 3}{3 \times 3} = \frac{6}{9}$$

$$\text{Now, } \frac{(-5)}{9} + \frac{6}{9} = \frac{-5+6}{9} = \frac{1}{9}$$

(iii) $-4 + \frac{1}{2}$

The denominators of the given rational numbers are 1 and 2.

L.C.M. of 1 and 2 is 2.

$$\frac{-4}{1} = \frac{(-4) \times 2}{1 \times 2} = \frac{-8}{2}$$

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

$$\text{Now, } \frac{(-8)}{2} + \frac{1}{2} = \frac{-8+1}{2} = \frac{-7}{2}$$

(i) $\frac{-7}{27} + \frac{5}{18}$

The denominators of the given rational numbers are 27 and 18.

3	27, 18
3	9, 6
3	3, 2

$$\frac{2}{1, 2}$$

$$1, 1$$

L.C.M. of 27 and 18 is 54.

$$\frac{-7}{27} = \frac{(-7) \times 2}{27 \times 2} = \frac{-14}{54}$$

$$\frac{5}{18} = \frac{5 \times 3}{18 \times 3} = \frac{15}{54}$$

$$\text{Now, } \frac{(-14)}{54} + \frac{15}{54} = \frac{-14+15}{54} = \frac{1}{54}$$

Q. 3 Answer :

(i) $\frac{-3}{5} + \frac{7}{5} + \frac{-1}{5}$

L.C.M. of the given rational number is 5.

$$\frac{(-3)}{5} = \frac{7}{5} = \frac{(-1)}{5}$$

$$= \frac{-3+7-1}{5} = \frac{-4+7}{5} = \frac{3}{5}$$

(ii) $\frac{-12}{7} + \frac{3}{7} + \frac{-2}{7}$

L.C.M. of the given rational number is 7.

$$\frac{(-12)}{7} = \frac{3}{7} = \frac{(-2)}{7}$$

$$= \frac{-12+3-2}{7} = \frac{-14+3}{7}$$

$$= \frac{-11}{7}$$

(iii) $\frac{11}{-12} + \frac{3}{-8} + \frac{1}{4}$

We need a positive denominator.

$$\frac{11}{-12} \times \frac{-1}{-1} = \frac{-11}{12} \text{ and } \frac{3}{-8} \times \frac{-1}{-1} = \frac{-3}{8}$$

L.C.M. of the denominators 12, 8 and 4 is 24.

$$\therefore \frac{-11 \times 2}{12 \times 2} = \frac{-22}{24}$$

$$\frac{-3 \times 3}{8 \times 3} = \frac{-9}{24}$$

$$\frac{1 \times 6}{4 \times 6} = \frac{6}{24}$$

$$\text{Now, } \frac{(-22)}{24} + \frac{(-9)}{24} + \frac{6}{24}$$

$$= \frac{-31+6}{24} = \frac{-25}{24}$$

(iv) $\frac{-16}{9} + \frac{-5}{12} + \frac{7}{18}$

L.C.M. of the denominators 9, 12 and 18 is 36.

$$\therefore \frac{16 \times 4}{9 \times 4} = \frac{-64}{36}$$

$$\frac{-5 \times 3}{12 \times 3} = \frac{-15}{36}$$

$$\frac{7 \times 2}{18 \times 2} = \frac{14}{36}$$

$$\text{Now, } \frac{(-64)}{36} + \frac{(-15)}{36} + \frac{14}{36}$$

$$= \frac{-64-15+14}{36} = \frac{-79+14}{36}$$

$$= \frac{-65}{36}$$

Q. 5 Answer :

- (i) $\frac{12}{5} = 2\frac{2}{5} = 2 + \frac{2}{5}$
- (ii) $\frac{-11}{7} = \left(-\frac{11}{7}\right) = \left(-1\frac{4}{7}\right) = -1 + \left(\frac{-4}{7}\right)$
- (iii) $\frac{-25}{9} = \left(-\frac{25}{9}\right) = -\left(2\frac{7}{9}\right) = -2 + \left(\frac{-7}{9}\right)$
- (iv) $\frac{-103}{20} = -\left(\frac{103}{20}\right) = \left(-5\frac{3}{20}\right) = -5 + \left(\frac{-2}{20}\right)$

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Exercises – 4D
Rational Numbers

Q. 1 Answer :

- (i) Additive inverse of 5 is -5.
- (ii) Additive inverse of -9 is 9.
- (iii) Additive inverse of $\frac{3}{14}$ is $\frac{-3}{14}$
- (iv) Additive inverse of $\frac{-11}{15}$ is $\frac{11}{15}$.

Q. 2 Answer :

- (i) $\frac{1}{3} - \frac{3}{4} = \frac{1}{3} + \left(\text{additive inverse of } \frac{3}{4}\right)$
 L.C.M. of 3 and 4 is 12.
 $\frac{1}{3} + \left(-\frac{3}{4}\right) = \frac{4+(-9)}{12}$
 $= \frac{-5}{12}$
- (ii) $\frac{1}{3} - \frac{(-5)}{6} = \frac{1}{3} + \left(\text{additive inverse of } \frac{-5}{6}\right)$
 $\frac{1}{3} + \frac{5}{6}$
 L.C.M. of 3 and 6 is 6.
 $= \frac{2+5}{6} = \frac{7}{6}$
- (iii) $\frac{(-3)}{5} - \frac{(-8)}{9} = \frac{(-3)}{5} + \left(\text{additive inverse of } \frac{-8}{9}\right)$
 $\frac{(-3)}{5} + \frac{8}{9}$
 L.C.M. of 5 and 9 is 45.
 $= \frac{27+40}{45} = \frac{13}{45}$
- (iv) $\frac{(-1)}{1} - \frac{(-9)}{7} = \frac{(-1)}{1} + \left(\text{additive inverse of } \frac{-9}{7}\right)$
 $\frac{(-1)}{1} + \frac{9}{7}$
 L.C.M. of 7 and 1 is 7.
 $= \frac{7+9}{7} = \frac{2}{7}$

Q. 3 Answer :

$$(i) \quad \frac{3}{4} - \frac{4}{5} \\ = \frac{3}{4} - \frac{4}{5} = \frac{3}{4} + \left(\text{additive inverse of } \frac{4}{5} \right)$$

L.C.M. of 4 and 5 is 20.

$$\frac{15-16}{20} \\ = \frac{-1}{16}$$

$$(ii) \quad \frac{-3}{1} - \frac{4}{7} = \frac{-3}{1} + \left(\text{additive inverse of } \frac{4}{7} \right) \\ = \frac{-3}{1} - \frac{4}{7} = \frac{-21-14}{7} \\ = \frac{-25}{7}$$

$$(iii) \quad \frac{7}{24} - \frac{10}{36} = \frac{7}{24} + \left(\text{additive inverse of } \frac{19}{36} \right) \\ = \frac{7}{24} - \frac{19}{36}$$

L.C.M. of 24 and 36 is 72.

$$= \frac{21-38}{72} \\ = \frac{-17}{72}$$

$$(iv) \quad \frac{14}{15} - \frac{13}{20} = \frac{14}{15} + \left(\text{additive inverse of } \frac{13}{20} \right) \\ = \frac{14}{15} - \frac{13}{20}$$

L.C.M. of 15 and 20 is 60.

$$= \frac{56-39}{60} \\ = \frac{17}{60}$$

Q. 4 Answer :

First we will find the sum of $\frac{-36}{11}$ and $\frac{49}{22}$.

$$\frac{-36}{11} + \frac{49}{22}$$

L.C.M. of 11 and 22 is 22.

$$= \frac{-72+49}{22} = \frac{-23}{22}$$

Now we have to find the sum of $\frac{33}{8}$ and $\frac{-19}{4}$.

$$\frac{33}{8} + \frac{(-19)}{4}$$

L.C.M. of 8 and 4 is 8.

$$= \frac{33-38}{8} = \frac{-5}{8}$$

$$\text{Now, } \frac{(-5)}{8} - \frac{(-23)}{22}$$

$$\frac{-5}{8} + \frac{23}{22}$$

L.C.M. of 8 and 22 is 88.

$$= \frac{-55+92}{88} = \frac{37}{88}$$

Q. 5 Answer :

Let the other number that be x .

$$\frac{5}{7} + x = \frac{4}{21}$$

$$\Rightarrow x = \frac{4}{21} - \frac{5}{7}$$

L.C.M. of 21 and 7 is 21.

$$\Rightarrow x = \frac{4-15}{21}$$

$$\Rightarrow x = \frac{-22}{21}$$

Hence, the required number is $\frac{-11}{21}$

Q. 6 Answer :

Let the other number that be x .

$$\frac{3}{16} + x = \frac{-3}{8}$$

$$\Rightarrow x = \frac{-3}{8} - \frac{3}{16}$$

L.C.M. of 8 and 16 is 16.

$$\Rightarrow x = \frac{-6-3}{16}$$

$$\Rightarrow x = \frac{-9}{16}$$

Q. 7 Answer :

Let the other number that be x .

$$\frac{-15}{7} + x = -3 - \frac{(-15)}{7}$$

$$\Rightarrow x = -3 - 15 \frac{7}{7} \Rightarrow x = -3 - \frac{(-15)}{7}$$

$$\Rightarrow x = \frac{-21+15}{7}$$

$$\Rightarrow x = \frac{-6}{7}$$

Hence, the required number is $\frac{-6}{7}$

Q. 8 Answer :

Let the other number that be x .

$$-5 + x = \frac{-4}{3}$$

$$\Rightarrow x = -3 - 15 \frac{7}{7} \Rightarrow x = \frac{-4}{3} + 5$$

$$\Rightarrow x = \frac{-4+15}{3}$$

$$\Rightarrow x = \frac{11}{3}$$

Hence, the required number is $\frac{11}{3}$

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Exercises – 4E

Q. 1 Answer :

$$(i) \quad \frac{3}{4} \times \frac{5}{7} = \frac{(3 \times 5)}{(4 \times 7)} = \frac{15}{28}$$

$$(ii) \quad \frac{9^3}{8^1} \times \frac{-32^4}{-3^1} = \frac{(3 \times 4)}{(1 \times 1)} = 12$$

$$(iii) \quad \frac{7}{6} \times \frac{24}{1} = 7 \times 4 = 28$$

$$(iv) \quad \frac{-2}{3} \times \frac{6}{7} = \frac{(-2 \times 2)}{7} = \frac{-4}{7}$$

Q. 2 Answer :

$$(i) \quad \frac{3}{20} \times \frac{4}{5} = \frac{3}{5} \times \frac{1}{5} \\ = \frac{3 \times 1}{5 \times 5} = \frac{3}{25}$$

$$(ii) \quad \frac{-7}{30} \times \frac{5}{14} \\ = \frac{-1 \times 1}{6 \times 2} = \frac{-1}{12}$$

$$(iii) \quad \frac{5}{18} \times \frac{9}{20} = \frac{1}{2} \times \frac{1}{4} \\ = \frac{1 \times (-1)}{-2 \times 4} \\ = \frac{-1}{-8} = \frac{1}{8}$$

$$(iv) \quad \frac{-9}{8} \times \frac{-16}{3} \\ = (-3) \times (-2) \\ = 6$$

Q. 3 Answer :

$$(i) \quad \frac{7}{24} \times (-48) \\ = 7 \times (-2) \\ = -14$$

$$(ii) \quad \frac{-19}{36} \times 16 \\ = \frac{-19}{9} \times 4 \\ = \frac{-76}{9}$$

$$(iii) \quad \frac{-9}{4} \times \frac{4}{3} \\ = -1$$

$$(iv) \quad -13 \times \frac{17}{26} \\ = \frac{-13 \times 17}{26} \\ = \frac{-17}{2}$$

Q. 4 Answer :

$$(i) \quad \left(\frac{13}{8} \times \frac{12}{13}\right) + \left(\frac{4}{9} \times \frac{3}{2}\right)$$

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

$$(ii) \quad \left(\frac{16}{15} \times \frac{-25}{8}\right) + \left(\frac{-14}{27} \times \frac{6}{7}\right)$$

$$= \left(\frac{16}{15} \times \frac{25}{8}\right) + \left(\frac{-14}{27} \times \frac{6}{7}\right)$$

$$= \left[\frac{2}{3} \times \frac{(-5)}{1}\right] + \left[\frac{(-2)}{27} \times \frac{6}{1}\right]$$

$$= \frac{(-10)}{3} + \frac{(-12)}{27}$$

$$= \frac{-10}{3} = \frac{-4}{9}$$

L.C.M. of 3 and 9 in 9.

$$= \frac{-30-4}{9}$$

$$= \frac{-34}{9}$$

Q. 5 Answer :

Cost of 1 meter cloth = Rs $40\frac{1}{2}$

Cost of $3\frac{1}{2}$ meter cloth = Rs $\left(40\frac{1}{2} \times 3\frac{1}{2}\right)$

$$= \text{Rs} \left(\frac{81}{2} \times \frac{7}{2}\right)$$

$$= \text{Rs} \frac{567}{4}$$

$$= \text{Rs } 141.75$$

Exercises – 4F

Q. 1 Answer :

$$(i) \quad \text{Multiplicative inverse of } 18 = \frac{1}{18}$$

$$(ii) \quad \text{Multiplicative inverse of } -16 = \frac{-1}{16}$$

$$(iii) \quad \text{Multiplicative inverse of } \frac{13}{25} = \frac{25}{13}$$

$$(iv) \quad \text{Multiplicative inverse of } \frac{-17}{12} = \frac{12}{-17}$$

Q. 2 Answer :

$$(i) \quad \frac{4}{9} \div \left(\frac{-5}{12}\right)$$

$$= \frac{4}{9} \times \frac{12}{(-5)}$$

$$= \frac{4 \times 4}{3 \times (-5)}$$

$$= \frac{-16}{15}$$

$$(ii) \quad -8 \div \left(\frac{-5}{16}\right)$$

$$= -8 \times \frac{-16}{5}$$

$$= \frac{128}{5}$$

$$\begin{aligned} \text{(iii)} \quad & \frac{-12}{7} \div (-18) \\ &= \frac{12}{7} \times \left(\frac{-1}{18}\right) \\ &= \frac{2}{21} \end{aligned}$$

$$\begin{aligned} \text{(iv)} \quad & \frac{-1}{10} \div \left(\frac{-8}{5}\right) \\ &= \frac{-1}{10} \times \left(\frac{5}{-8}\right) \\ &= \frac{-1}{2} \times \frac{1}{(-8)} \\ &= \frac{-1}{-16} = \frac{1}{16} \end{aligned}$$

Q. 3 Answer :

$$\begin{aligned} \text{(i)} \quad & (\dots ? \dots) \div \frac{-7}{5} = \frac{10}{19} \\ & (\dots ? \dots) = \frac{10}{19} \times \frac{-7}{5} \\ & (\dots ? \dots) = \frac{-14}{19} \\ \text{(ii)} \quad & (\dots ? \dots) \div (-3) = \frac{-4}{15} \\ & (\dots ? \dots) = \frac{-4}{15} \times (-3) \\ & (\dots ? \dots) = \frac{4}{5} \\ \text{(iii)} \quad & \frac{9}{8} \div (\dots ? \dots) = \frac{-3}{2} \\ & \frac{9}{8} \div (\dots ? \dots) = \frac{(-3)}{2} \\ & (\dots ? \dots) = \frac{9}{8} \times \frac{2}{-3} \\ & (\dots ? \dots) = \frac{-3}{4} \end{aligned}$$

Q. 4 Answer :

$$\text{Sum} = \frac{65}{12} + \frac{8}{3} = \frac{65+32}{12} = \frac{97}{12}$$

$$\text{Difference} = \frac{65}{12} - \frac{8}{3} = \frac{65-32}{12} = \frac{33}{12}$$

$$\begin{aligned} & \frac{97}{12} \div \frac{33}{12} \\ &= \frac{97}{12} \times \frac{12}{33} = \frac{97}{33} \end{aligned}$$

Q. 5 Answer :

Let the required number be x .

$$\begin{aligned} & \frac{-44}{9} \div x = \frac{-11}{3} \\ \Rightarrow x &= \frac{-44}{9} \times \frac{3}{-11} \\ \Rightarrow x &= \frac{4}{3} \end{aligned}$$

Q. 6 Answer :

Let the required number be x .

$$x \times \left(\frac{-8}{15}\right) = 24$$

$$x = 24 \div \frac{-8}{15}$$

$$= 24 \times \left(\frac{15}{-8}\right)$$

$$= \frac{45 \times (-1)}{-1 \times (-1)} = -45$$

Q. 7 Answer :

Let the other number be x .

$$x \times -8 = 10$$

$$\Rightarrow x = 10 \div (-8)$$

$$= 10 \times \frac{1}{-8} = 5 \times \frac{1}{-4}$$

$$\text{Other number} = \frac{-5}{4}$$

