Rational Numbers
Exercise 4F

Q1

Answer :

$\left(i\right)$ Multiplicative inverse of $18 = \frac{1}{18}$

$ii\right)$ Multiplicative inverse of $-16 = \frac{-1}{16}$

$iii\right)$ Multiplicative inverse of $\frac{13}{25} = \frac{25}{13}$

$iv\right)$ Multiplicative inverse of $\frac{-17}{12} = \frac{12}{-17}$

$v\right)$ Multiplicative inverse of $\frac{-6}{19} = \frac{19}{-6}$

$vi\right)$ Multiplicative inverse of $\frac{-3}{-5} = \frac{-5}{-3} = \frac{5}{3}$

$vii\right)$ Multiplicative inverse of $-1 = \frac{1}{-1} = -1$

$viii\right)$ Multiplicative inverse of $0 = \frac{1}{0} = $ infinity

Hence, it does not exist.

Q2

Answer :

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

$= \frac{4}{\cancel{9}_3} \times \frac{\cancel{12}^4}{(-5)}$

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

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

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

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

$= \frac{128}{5}$

(iii) $\frac{-12}{7} \div \left(-18\right)$

$= \frac{\cancel{-12}^2}{7} \times \left(\frac{-1}{\cancel{-18}_3}\right)$

$= \frac{2}{21}$

(iv) $\frac{-1}{10} \div \left(\frac{-8}{5}\right)$

$= \frac{-1}{\cancel{10}^2} \times \left(\frac{\cancel{5}}{-8}\right)$

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

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

$= \frac{1}{16}$

(v) $\frac{-16}{35} \div \left(\frac{-15}{14}\right)$

$= \frac{-16}{\cancel{35}_5} \times \frac{\cancel{14}^2}{(-15)}$

$= \frac{-32}{-75}$

$= \frac{32}{75}$

(vi) $\left(\frac{-65}{14}\right) \div \left(\frac{13}{-7}\right)$

$= \left(\frac{\cancel{-65}^5}{\cancel{14}_2}\right) \times \frac{\left(\cancel{-7}\right)}{\cancel{13}}$

$= \left(\frac{-5}{2}\right) \times \left(\frac{-1}{1}\right)$

$= \frac{5}{2}$

Q3

Answer :

(i) $(...?...) \div \frac{-7}{5} = \frac{10}{19}$

$(...?...) = \frac{10}{19} \times \frac{-7}{5}$

$(...?...) = \frac{-14}{19}$

(ii) $(..?..) \div (-3) = \frac{-4}{15}$

$(...?..) = \frac{-4}{15} \times (-3)$

$(...?..) = \frac{4}{5}$

(iii) $\frac{9}{8} \div (..?..) = \frac{-3}{2}$

$\frac{9}{8} \div (..?..) = \frac{(-3)}{2}$

$(..?..) = \frac{9}{8} \times \frac{2}{(-3)}$

$(..?..) = \frac{-3}{4}$

(iv) $(-12) \div (..?..) = \frac{-6}{5}$

$(..?..) = (-12) \times \left(\frac{5}{-6}\right)$

$(..?..) = 10$

Answer :

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

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

$\frac{97}{12} \div \frac{33}{12}$

$= \frac{97}{\cancel{12}_1} \times \frac{\cancel{12}^1}{33}$

$= \frac{97}{33}$

Q5

Answer :

Let the required number be x.

$\frac{-44}{9} \div x = \frac{-11}{3}$

$\Rightarrow x = \frac{-\cancel{44}^4}{\cancel{9}_3} \times \frac{\cancel{-3}}{\cancel{-11}}$

$\Rightarrow x = \frac{4}{3}$

Q6

Answer :

Let the required number be x.

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

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

$= \cancel{24}^3 \times \left(\frac{15}{\cancel{-8}_1}\right)$

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

$= -45$

Q7

Answer :

Let the other number be x.

$x \times -8 = 10$

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

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

$= \cancel{10}^5 \times \frac{1}{\cancel{-8}_4}$

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

Q8

Answer :

Let the other number be x.

$x \times (-12) = -9$

$\Rightarrow x = -9 \div (-12)$

$= -9 \times \left(\frac{1}{-12}\right)$

$= -9 \times \left(\frac{-1}{12}\right)$

$= \frac{-\overset{3}{\cancel{9}}}{\cancel{-12}_{4}}$

Hence, the other number is $\frac{3}{4}$.

Q9

Answer :

Let the other number be x.

$x \times \left(\frac{-4}{3}\right) = \frac{-16}{9}$

$\Rightarrow x = \frac{-16}{9} \div \left(\frac{-4}{3}\right)$

$= \frac{-\overset{4}{\cancel{16}}}{\cancel{9}_{3}} \times \left(\frac{\cancel{3}^{1}}{-\cancel{4}_{1}}\right)$

$= \frac{4}{3}$

Hence, the other number is $\frac{4}{3}$.

Q10

Answer :

Let the required number be x.

$x \times \left(\frac{-8}{39}\right) = \frac{5}{26}$

$\Rightarrow x = \frac{5}{26} \div \left(\frac{-8}{39}\right)$

$= \frac{5}{\cancel{26}_{2}} \times \left(\frac{\cancel{39}^{3}}{-8}\right)$

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

Hence, the required number is $\frac{-15}{16}$.

Q11

Answer :

Length of the cloth required to prepare 24 trousers $= 54\,m$

Length of the cloth required for each pair of trousers $= 54 \div 24$

$= \frac{\cancel{54}^{9}}{\cancel{24}_{4}}$

$= \frac{9}{4} = 2\frac{1}{4}\,m$

Hence, $2\frac{1}{4}$ m length of cloth is required for each pair of trousers.

Q12

Answer :

Length of a rope $= 30\,m$

Number of pieces $= 30 \div 3\frac{3}{4} = 30 \div \frac{15}{4}$

$= \overset{2}{\cancel{30}} \times \frac{4}{\cancel{15}}$

$= 8$

Hence, the number of pieces would be 8.

Q13

Answer :

Cost of $2\frac{1}{2}$ m cloth $=$ Rs $78\frac{3}{4}$

Cost of cloth per meter $= 78\frac{3}{4} \div 2\frac{1}{2}$

$= \frac{315}{4} \div \frac{5}{2}$

$= \frac{\cancel{315}^{63}}{\cancel{4}_{2}} \times \frac{\cancel{2}^{1}}{\cancel{5}_{1}}$

$=$ Rs $\frac{63}{2} =$ Rs $31\frac{1}{2}$

$\therefore$ Cost of the cloth (per metre) $=$ Rs $31\frac{1}{2}$