Question 1

Find the products :

Answer

Ans. *(i)* The product of $\dfrac{4}{9} \times \dfrac{7}{12} = \dfrac{1 \times 7}{9 \times 3} = \dfrac{7}{27}$

(ii) The product of $-9 \times \dfrac{7}{18} = \dfrac{-1 \times 7}{2}$

$= \dfrac{-7}{2} = -3\dfrac{1}{2}$

(iii) The product of $\dfrac{-3}{16} \times \dfrac{8}{-15}$

$= \dfrac{(-1) \times (1)}{2 \times (-5)} = \dfrac{-1}{-10} = \dfrac{1}{10}$

(iv) The product of $\dfrac{6}{7} \times \dfrac{-21}{12}$

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

(v) $\dfrac{5}{-18} \times \dfrac{-9}{20}$

$= \dfrac{5 \times (-9)}{-18 \times 20} = \dfrac{-45}{-360} = \dfrac{-45 \div 45}{-360 \div 45}$

$= \dfrac{-1}{-8} = \dfrac{1}{8}$

(vi) $\dfrac{-13}{15} \times \dfrac{-25}{26} = \dfrac{-13 \times (-25)}{15 \times 26} = \dfrac{325}{390}$

$= \dfrac{325 \div 65}{390 \div 65} = \dfrac{5}{6}$

(vii) $\dfrac{7}{24} \times (-48) = \dfrac{7 \times (-48)}{24}$

$= 7 \times (-2) = -14$

(viii) $\dfrac{-13}{5} \times (-10) = \dfrac{-13 \times (-10)}{5}$

$= -13 \times (-2) = 26$ Ans.

Question 2

find multiplicative inverse.....

Answer

Ans. (*i*) Multiplicative inverse of $\dfrac{-17}{12} = \dfrac{-12}{17}$

(*ii*) Multiplicative inverse of $-16 = \dfrac{-1}{16}$

(*iii*) Multiplicative inverse of $\dfrac{0}{2}$ = does not exists.

(*iv*) Multiplicative inverse of $\dfrac{-3}{-5} = \dfrac{-5}{-3}$

(*v*) Multiplicative inverse of $\dfrac{2}{-5} = \dfrac{-5}{2}$

Question 3

Find the quotient

Answer

Ans. (*i*) The quotient of $\dfrac{17}{8} \div \dfrac{51}{4}$

$$= \dfrac{17}{8} \times \dfrac{4}{51} = \dfrac{1\times1}{2\times3} = \dfrac{1}{6}$$

(*ii*) The quotient of $\dfrac{-16}{35} \div \dfrac{15}{14}$

$$= \dfrac{-16}{35} \times \dfrac{14}{15} = \dfrac{-16\times2}{5\times15} = \dfrac{-32}{75}$$

(*iii*) The quotient of $\dfrac{-12}{7} \div (-16)$

$$= \dfrac{-12}{7} \times \dfrac{1}{-16} = \dfrac{-3\times1}{7\times(-4)} = \dfrac{-3}{-28} = \dfrac{3}{28}$$

(*iv*) The quotient of $-9 \div \left(\dfrac{-5}{18}\right)$

$$= -9 \times \dfrac{18}{-5} = \dfrac{-162}{-5} = \dfrac{162}{5} = 32\dfrac{2}{5}$$

Question 4

Name …………..statement

Answer

Ans. *(i)* $\dfrac{-8}{9} \times \dfrac{-13}{7} = \dfrac{-8 \times 13}{9 \times 7} = \dfrac{104}{63}$

and $\dfrac{-13}{7} \times \dfrac{-8}{9} = \dfrac{-13 \times -8}{7 \times 9} = \dfrac{104}{63}$

$\therefore \dfrac{-8}{9} \times \dfrac{-13}{7} = \dfrac{-13}{7} \times \dfrac{-8}{9}$

Commutative property as law of

$$\left(\dfrac{a}{b} \times \dfrac{c}{d}\right) = \left(\dfrac{c}{d} \times \dfrac{a}{b}\right)$$

(ii) $\left(\dfrac{-3}{4} \times \dfrac{5}{7}\right) \times \dfrac{-9}{11} = \dfrac{-3}{4} \times \left(\dfrac{5}{7} \times \dfrac{-9}{11}\right)$

and $\dfrac{-3}{4} \times \left(\dfrac{5}{7} \times \dfrac{-9}{11}\right) = \dfrac{-3}{4} \times \dfrac{-45}{77} = \dfrac{135}{308}$

Associative law of property as

$$\left(\dfrac{a}{b} \times \dfrac{c}{d}\right) \times \dfrac{e}{f} = \dfrac{a}{b} \times \left(\dfrac{c}{d} \times \dfrac{e}{f}\right)$$

(iii) $\dfrac{-2}{3} \times \left(\dfrac{-5}{6} + \dfrac{7}{8}\right) = \left(\dfrac{-2}{3} \times \dfrac{-5}{6}\right) + \left(\dfrac{-2}{3} \times \dfrac{7}{8}\right)$

$\dfrac{-2}{3} \times \left(\dfrac{-5}{6} + \dfrac{7}{8}\right) = \dfrac{-2}{3} \times \left(\dfrac{-20 + 21}{24}\right)$

$= \dfrac{-2}{3} \times \left(\dfrac{1}{24}\right) = \dfrac{-2}{72}$

and $\left(\dfrac{-2}{3} \times \dfrac{-5}{6}\right) + \left(\dfrac{-2}{3} \times \dfrac{7}{8}\right) = \dfrac{10}{18} + \dfrac{-14}{24}$

$= \dfrac{40 - 42}{72} = \dfrac{-2}{72}$

Distributive law of multiplication over addition as :

$$\dfrac{a}{b} \times \left(\dfrac{c}{d} + \dfrac{e}{f}\right) = \left(\dfrac{a}{b} \times \dfrac{c}{d}\right) + \left(\dfrac{a}{b} \times \dfrac{e}{f}\right)$$

(iii) $\dfrac{-2}{3} \times \left(\dfrac{-5}{6} + \dfrac{7}{8} \right) = \left(\dfrac{-2}{3} \times \dfrac{-5}{6} \right) + \left(\dfrac{-2}{3} \times \dfrac{7}{8} \right)$

$\dfrac{-2}{3} \times \left(\dfrac{-5}{6} + \dfrac{7}{8} \right) = \dfrac{-2}{3} \times \left(\dfrac{-20+21}{24} \right)$

$= \dfrac{-2}{3} \times \left(\dfrac{1}{24} \right) = \dfrac{-2}{72}$

and $\left(\dfrac{-2}{3} \times \dfrac{-5}{6} \right) + \left(\dfrac{-2}{3} \times \dfrac{7}{8} \right) = \dfrac{10}{18} + \dfrac{-14}{24}$

$= \dfrac{40-42}{72} = \dfrac{-2}{72}$

Distributive law of multiplication over addition as :

$$\dfrac{a}{b} \times \left(\dfrac{c}{d} + \dfrac{e}{f} \right) = \left(\dfrac{a}{b} \times \dfrac{c}{d} \right) + \left(\dfrac{a}{b} \times \dfrac{e}{f} \right)$$

(iv) $\dfrac{-18}{7} \times 1 = 1 \times \dfrac{-18}{7} = \dfrac{-18}{7}$

$\dfrac{-18}{7} \times 1 = \dfrac{-18}{7}$

and $1 \times \dfrac{-18}{7} = \dfrac{-18}{7}$ multiplicative identity as

$$\left(\dfrac{a}{b} \times 1 \right) = \left(1 \times \dfrac{a}{b} \right) = \dfrac{a}{b}$$

(v) $\dfrac{-13}{17} \times \dfrac{17}{-13} = \dfrac{17}{-13} \times \dfrac{-13}{17} = 1$

$\dfrac{-13}{17} \times \dfrac{17}{-13} = 1$ and $\dfrac{17}{-13} \times \dfrac{-13}{17} = 1$

Existence of multiplicative inverse as

$$\left(\dfrac{a}{b} \times \dfrac{b}{a} \right) = \left(\dfrac{b}{a} \times \dfrac{a}{b} \right) = 1$$

(vi) $\dfrac{-9}{7} \times 0 = 0$

Multiplicative property of zero as

$$\left(\dfrac{a}{b} \times 0 \right) = \left(0 \times \dfrac{a}{b} \right) = 0$$

Ans.(i) L.H.S. $= \dfrac{-8}{9} \div \dfrac{-4}{3} = \dfrac{-8}{9} \times \dfrac{3}{-4}$

$$= \dfrac{-8 \times 3}{9 \times (-4)} = \dfrac{-24}{-36}$$

$$= \dfrac{24}{36} = \dfrac{24 \div 12}{36 \div 12} = \dfrac{2}{3}$$

R.H.S. $= \dfrac{-4}{3} \div \dfrac{-8}{9} = \dfrac{-4}{3} \times \dfrac{9}{-8} = \dfrac{-36}{-24}$

$$= \dfrac{36}{24} = \dfrac{36 \div 12}{24 \div 12} = \dfrac{3}{2}$$

$\therefore$ It is false.

(ii) L.H.S. $= \dfrac{-7}{24} \div \dfrac{3}{-16} = \dfrac{-7}{24} \times \dfrac{-16}{3}$

$$= \dfrac{-7 \times (-16)}{24 \times 3} = \dfrac{112}{72}$$

$$= \dfrac{112 \div 8}{72 \div 8} = \dfrac{14}{9}$$

R.H.S. $= \dfrac{3}{-16} \div \dfrac{-7}{24} = \dfrac{3}{-16} \times \dfrac{24}{-7}$

$$= \dfrac{3 \times 24}{-16 \times (-7)} = \dfrac{72}{-112} = \dfrac{72 \div 8}{-112 \div 8}$$

$$= \dfrac{9}{-14}$$

$\therefore$ It is false.

(iii) L.H.S. $= \left[\dfrac{-3}{5} \div \dfrac{-12}{35}\right] \div \dfrac{1}{4}$

$$= \left[\dfrac{-3}{5} \times \dfrac{35}{-12}\right] \div \dfrac{1}{4}$$

$$= \dfrac{-105}{-60} \div \dfrac{1}{14} = \dfrac{105}{60} \times \dfrac{4}{1} = 7$$

R.H.S. $= \dfrac{-3}{5} \div \left[\dfrac{-12}{35} \div \dfrac{1}{4}\right]$

$$= \dfrac{-3}{5} \div \left[\dfrac{-12}{35} \times \dfrac{4}{1}\right]$$

$$= \dfrac{-3}{5} \div \left[\dfrac{-48}{35}\right]$$

$$= \dfrac{-3}{5} \times \dfrac{35}{-48} = \dfrac{-7}{-48}$$

Question 6

fill in the blanks............

Answer

6. Fill in the blanks :

(i) _____ is the rational number that does not have a multiplicative inverse.

(ii) _____ and _____ are the rational numbers which are equal to their own reciprocals.

(iii) The product of a rational number and its reciprocal is _____.

(iv) The reciprocal of a positive rational number is _____

(v) The reciprocal of a negative rational number is _____

(vi) _____ is not the reciprocal of any number.

(vii) The multiplicative inverse of a rational number $\frac{1}{a}$, $a \neq 0$ is _____

Ans.

(i) **0** is the rational number that does not have a multiplicative inverse.

(ii) **1** and **−1** are the rational numbers which are equal to their own reciprocals.

(iii) The product of a rational number and its reciprocal is **1**.

(iv) The reciprocal of a positive rational number is **positive**.

(v) The reciprocal of a negative rational number is **negative**.

(vi) **0** is not the reciprocal of any number.

(vii) The multiplicative inverse of a rational number $\frac{1}{a}$, $a \neq 0$ is **a**.

Question 7

the product of ....others.

Answer

Ans. Product of two rational numbers = −7

$$\text{One number} = \frac{-8}{11}$$

$$\therefore \text{Second number} = -7 \div \frac{-8}{11}$$

$$= -7 \times \frac{11}{-8} = \frac{-77}{-8} = \frac{77}{8}$$

Question 8

the product of ....others.

Answer

Ans. Product of two rational numbers

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

$$\text{One number} = \frac{-4}{3}$$

Let x be the second number,

$$\text{then } x + \frac{-4}{3} = \frac{-16}{3}$$

$$x = \frac{-16}{9} \div \frac{-4}{3} - \frac{-16}{9} \times \frac{3}{-4}$$

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

$$\therefore \text{Second number} = \frac{4}{3} \text{ Ans.}$$

Question 9

By what ....get........

Answer

Ans. Let required number $= x$, then

$$\frac{1}{26} \div x = \frac{-8}{39} \quad \Rightarrow \quad \frac{1}{26} \times \frac{1}{x} = \frac{-8}{39}$$

$$\Rightarrow \quad \frac{1}{x} = \frac{-8}{39} \times \frac{26}{1} = \frac{-16}{3}$$

$$\therefore x = \frac{-3}{16} \quad \therefore \text{Required number} = \frac{-3}{16}$$

Question 10

divide.............and..........

Answer

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 $\frac{1}{-2}$

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

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

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

$$= \frac{14 \div 7}{35 \div 7} = \frac{2}{5} \text{ Ans.}$$

Question 11

divide ....deferenc

Answer

Ans. Sum of $\dfrac{65}{12}$ and $\dfrac{8}{3}$ $= \dfrac{65}{12} + \dfrac{8}{3}$

$$= \dfrac{65+32}{12} = \dfrac{97}{12}$$

Difference of $\dfrac{65}{12}$ and $\dfrac{8}{3}$ $= \dfrac{65}{12} - \dfrac{8}{3}$

$$= \dfrac{65-32}{12} = \dfrac{33}{12}$$

$$\therefore \dfrac{97}{12} \div \dfrac{33}{12} = \dfrac{97}{12} \times \dfrac{12}{33} = \dfrac{97}{33} \quad \text{Ans.}$$

Question 12

find ....per meter

Answer

Ans. Cost of 1 metre cloth $= Rs\ 63\dfrac{3}{4}$

$$= Rs\ \dfrac{255}{4}$$

$\therefore$ Cost of $3\dfrac{2}{5}$ metres $= Rs\ \dfrac{255}{4} \times \dfrac{17}{5}$

$$= Rs\ \dfrac{51 \times 17}{4} = \dfrac{867}{4}$$

$$= Rs\ 216\dfrac{3}{4} \quad \text{Ans.}$$

Question 13

find ....broad

Answer

and breadth $= 16\dfrac{2}{5} = \dfrac{82}{5}$ m

Area = Length × Breadth

$= \dfrac{183}{5} \times \dfrac{82}{5} = \dfrac{183 \times 82}{5 \times 5}$ km²

$= \dfrac{15006}{25}$ m² $= 600\dfrac{6}{25}$ m² Ans.

Question 14

find ....meter

Answer

Ans. Side of a square plot $= 8\dfrac{1}{2}$ m $= \dfrac{17}{2}$ m

Area = (Side)² = Side × Side

$= \dfrac{17}{2} \times \dfrac{17}{2}$ m² $= \dfrac{289}{4}$ m²

$= 72\dfrac{1}{4}$ m² Ans.

Question 15

a cost ....piece.

Answer

Ans. Total length of piece of chord = $71\frac{1}{2}$ m

No. of pieces = 26

Length of each piece = $71\frac{1}{2} \div 26$ m

$$= \frac{143}{2} \div 26$$

$$= \frac{143}{2} \times \frac{1}{26} \text{ m}$$

$$= \frac{143}{52} \text{ m} = \frac{143 \div 13}{52 \div 13} \text{ m}$$

$$= \frac{11}{4} \text{ m} = 2\frac{3}{4} \text{ m Ans.}$$

Question 16

the area ....length

Answer

Ans. Area of a room = $65\frac{1}{4}$ m²

Breadth = $5\frac{1}{16}$ m

∴ Length = Area ÷ Breadth

$$= \left(65\frac{1}{4} \div 5\frac{1}{16}\right) \text{ m}$$

$$= \frac{261}{4} \div \frac{81}{16} = \frac{261}{4} \times \frac{16}{81} \text{ m}$$

$$= \frac{4176}{324} = \frac{116}{9} = 12\frac{8}{9} \text{ m Ans.}$$