

Chapter 4Rational numbersExercise 4.1

Q1(a) Write two rational numbers with denominator a prime number and the numerator a number one less than the denominator.

Denominator is prime number $\Rightarrow 5$
 Numerator a no. one less than $\Rightarrow 4$
 the denominator

Ans $\Rightarrow \frac{4}{5}$

Q1 Write two rational numbers with denominator a multiple of 3 and numerator a multiple of 4, such that the denominator is less than the numerator.

Numerator $\Rightarrow 4 \times 4 \Rightarrow 16$
 Denominator $\Rightarrow 3 \times 5 \Rightarrow 15$
 $\Rightarrow$ Ans $\Rightarrow \frac{16}{15}$



Q. 6a) Write the rational number whose numerator is the largest two-digit number and denominator is the smallest three-digit number.

Ans: Numerator largest 2 digit no. = 99
Denominator smallest 3 digit no. = 100
Ans: $\frac{99}{100}$

Q. 6b) Write the rational number whose numerator is the smallest 4-digit number and denominator is the largest 5-digit number.

Ans: Numerator smallest 4 digit no. = 1000
Denominator largest 5 digit no. = 99999
Ans: $\frac{1000}{99999}$

Q. 6c) Write the following rational number in standard form:

(a) $\frac{5}{-9}$

Ans: Standard form of $\frac{5}{-9} = -\frac{5}{9}$

(b) $\frac{3}{-8}$

Ans: Standard form of $\frac{3}{-8} = -\frac{3}{8}$

(a) $\frac{4}{-28}$

Ans: Standard form of $\frac{4}{-28} = -\frac{1}{7}$

(b) $\frac{-6}{-12}$

Ans: Standard form of $\frac{-6}{-12} = \frac{1}{2}$

Q. 5) Fill in the blanks:

Q. 5) Fill in the boxes:

(a) $\frac{-2}{9} = \frac{6}{\boxed{}} = \frac{\boxed{}}{36}$

$\Rightarrow \frac{-2}{9} = \frac{6}{x}$

$= \frac{6}{-27} = \frac{x}{36}$

$\Rightarrow -2 \times x = 6 \times 9$

$-2x = 54$

$x = \frac{54}{-2}$

-27

$\Rightarrow -27 \times x = 6 \times 36$

$\Rightarrow -27x = 216$

$\Rightarrow x = \frac{216}{-27}$

-8

Ans: $(x = -27)$

Ans: $(x = -27)$

$\Rightarrow \frac{-2}{9} = \frac{6}{\boxed{-27}} = \frac{\boxed{54}}{36}$



$$(b) \frac{4}{5} = \frac{\square}{-20} = \frac{-24}{\square}$$

$$\Rightarrow \frac{4}{5} = \frac{x}{-20}$$

$$\Rightarrow 5 \times x = 4 \times (-20)$$

$$\Rightarrow 5x = -80$$

$$\Rightarrow x = \frac{-80}{5}$$

$$\text{Ans} \Rightarrow \boxed{x = -16}$$

$$\Rightarrow \frac{4}{5} = \frac{-16}{-20} = \frac{-24}{\boxed{-30}}$$

$$\Rightarrow \frac{-16}{-20} = \frac{-24}{x}$$

$$\Rightarrow -16 \times x = -20 \times (-24)$$

$$\Rightarrow -16x = 480$$

$$\Rightarrow x = \frac{480}{-16}$$

$$\text{Ans} \Rightarrow \boxed{x = -30}$$

$$(c) \frac{5}{-7} = \frac{-25}{\square} = \frac{\square}{63}$$

$$\Rightarrow \frac{5}{-7} = \frac{-25}{x}$$

$$\Rightarrow \frac{-25}{35} = \frac{x}{63}$$

$$\Rightarrow 5 \times x = -25 \times (-7)$$

$$\Rightarrow 5x = 175$$

$$\Rightarrow x = \frac{175}{5}$$

$$\text{Ans} \Rightarrow \boxed{x = 35}$$

$$\Rightarrow \frac{5}{-7} = \frac{-25}{35} = \frac{\boxed{45}}{63}$$

$$\Rightarrow -25 \times 63 = x \times 35$$

$$\Rightarrow -25 \times 63 = x$$

$$\Rightarrow -1575 = x$$

$$\text{Ans} \Rightarrow \boxed{x = -1575}$$

$$(d) \frac{8}{11} = \frac{\square}{-33} = \frac{32}{\square}$$

$$\Rightarrow \frac{8}{11} = \frac{x}{-33}$$

$$\Rightarrow 8 \times (-33) = 11 \times x$$

$$\Rightarrow -264 = 11x$$

$$\text{Ans} \Rightarrow \boxed{-24 = x}$$

$$\Rightarrow \frac{8}{11} = \frac{-24}{33} = \frac{32}{\boxed{44}}$$

$$\Rightarrow \frac{-24}{-33} = \frac{32}{x}$$

$$\Rightarrow -24 \times x = -33 \times 32$$

$$\Rightarrow x = \frac{-33 \times 32}{-24}$$

$$\Rightarrow x = 44$$

$$\text{Ans} \Rightarrow \boxed{x = 44}$$

Q-6 (a) Write three equivalent rational number for $\frac{3}{8}$, one of these should have numerator (-24).

$\Rightarrow$ The three equivalent rational no. for $\frac{3}{8} =$

$$= \frac{3 \times 2}{8 \times 2}, \frac{3 \times 3}{8 \times 3}$$

$$= \frac{6}{16}, \frac{9}{24}$$

$\Rightarrow$ The first equivalent rational no. for $\frac{3}{8} =$

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

$\Rightarrow$ The second equivalent rational no. for $\frac{3}{8} =$

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



→ The third equivalent rational no. for $\frac{3}{8}$
 numerator = (-24)
 denominator = 64

(b) Write three equivalent rational numbers for $-\frac{5}{7}$, one of which should have denominator (-56)

→ The first of equivalent rational no. for $-\frac{5}{7}$
 $= \frac{-5 \times 2}{7 \times 2}$
 $= \frac{-10}{14}$

→ The second of equivalent rational no. for $-\frac{5}{7}$
 $= \frac{-5 \times 3}{7 \times 3}$
 $= \frac{-15}{21}$

→ The third of equivalent rational no. for $-\frac{5}{7}$
 denominator = (-56)
 $= \frac{-40}{-56}$

Q7 (a) Find a and y such that $\frac{3}{4} = \frac{336}{a}$ and $\frac{5}{8} = \frac{y}{a}$

$$\Rightarrow \frac{3}{4} = \frac{336}{a}$$

$$\Rightarrow 3 \times a = 336 \times 4$$

$$\Rightarrow a = \frac{336 \times 4}{3} \Rightarrow \boxed{a = 448}$$

$$\Rightarrow \frac{5}{8} = \frac{y}{448}$$

$$\Rightarrow \frac{5 \times y}{8} = \frac{5 \times 448}{8}$$

$$\Rightarrow \boxed{y = 280}$$

Ans $\Rightarrow a = 448$
 $y = 280$

(b) Find b and c such that: $\frac{4}{5} = \frac{240}{c}$ and $\frac{2}{3} = \frac{b}{c}$

$$\Rightarrow \frac{4}{5} = \frac{240}{c}$$

$$\Rightarrow \frac{4 \times c}{5} = \frac{240 \times 5}{5}$$

$$\Rightarrow \boxed{c = 300}$$

$$\frac{2}{3} = \frac{b}{300}$$

$$\Rightarrow \frac{2 \times 300}{3} = \frac{3 \times b}{3}$$

$$\Rightarrow \boxed{200 = b}$$

Ans $\Rightarrow b = 200$
 $c = 300$

Q8 Write the following as decimal numbers.

(a) $\frac{7}{8}$

Ans $\Rightarrow 0.875$

(b) $\frac{11}{16}$

Ans $\Rightarrow 0.6875$

(c) $\frac{1}{6}$

Ans $\Rightarrow 0.1\bar{6}$ approx



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$$(d) \frac{3}{4} \times \frac{5}{9}$$

Ans $\Rightarrow$ 0.5 approx

Q.9 evaluate:

$$(a) \left| \frac{49}{132} \right|$$

$$(b) \left| \frac{65}{231} \right|$$

$$\text{Ans} \Rightarrow \frac{49}{132}$$

$$\text{Ans} \Rightarrow \frac{65}{231}$$

$$(c) \left| \frac{3}{5} \times \frac{-1}{6} \right| + \left| \frac{3}{10} \times \frac{7}{10} \right|$$

$$\text{Ans} \Rightarrow \left| \frac{-3}{30} \right| + \left| \frac{21}{140} \right|$$

$$\frac{3}{30} + \frac{3}{140}$$

$$\frac{1}{10} + \frac{1}{140}$$

$$\frac{14}{140} + \frac{1}{140}$$

$$\text{Ans} \Rightarrow \frac{15}{140} = \frac{3}{28}$$

Q.12 (a) Arrange in ascending order.

$$(i) \frac{-4}{5}, \frac{8}{-9}, \frac{-6}{7}, \frac{3}{-4}$$

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$$\Rightarrow \frac{-1008}{1260}, \frac{-1120}{1260}, \frac{-1080}{1260}, \frac{-945}{1260}$$

Ans $\Rightarrow$ A ascending order are: $\frac{8}{-9} < \frac{-6}{7} < \frac{-4}{5} < \frac{3}{-4}$

$$(ii) \frac{-5}{7}, \frac{-6}{8}, \frac{4}{-9}, \frac{-5}{12}$$

$$\Rightarrow \frac{-360}{504}, \frac{-336}{504}, \frac{-224}{504}, \frac{-210}{504}$$

Ans $\Rightarrow$ A ascending order are: $\frac{-5}{7} < \frac{-6}{8} < \frac{4}{-9} < \frac{-5}{12}$

(b) Arrange in descending order.

$$(i) \frac{-3}{5}, \frac{-11}{18}, \frac{4}{-9}, \frac{8}{-10}$$

$$\Rightarrow \frac{-54}{90}, \frac{-55}{90}, \frac{-40}{90}, \frac{-21}{90}$$

Ans $\Rightarrow$ A descending order are: $\frac{3}{-10} > \frac{4}{-9} > \frac{-3}{5} > \frac{-11}{18}$

$$(ii) \frac{8}{-12}, \frac{-2}{4}, \frac{-3}{8}, \frac{-4}{9}$$

$$\Rightarrow \frac{-48}{72}, \frac{-36}{72}, \frac{-27}{72}, \frac{-32}{72}$$



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Ans → A descending order are $-\frac{3}{8} > -\frac{4}{9} > -\frac{2}{4} > -\frac{1}{12}$

Q.13 (a) Write six rational number between $-\frac{2}{7}$ and $-\frac{4}{9}$

→ $-\frac{19}{63}, -\frac{20}{63}$

→ $-\frac{19}{63}, -\frac{20}{63}, -\frac{21}{63}, -\frac{22}{63}, -\frac{23}{63}, -\frac{24}{63}$

Ans → six rational number between $-\frac{2}{7}$ and $-\frac{4}{9}$

are $-\frac{19}{63}, -\frac{20}{63}, -\frac{21}{63}, -\frac{22}{63}, -\frac{23}{63}, -\frac{24}{63}$

(b) Write five rational number between $-\frac{3}{7}$ and $-\frac{5}{11}$

$-\frac{33}{77}, -\frac{35}{77}$

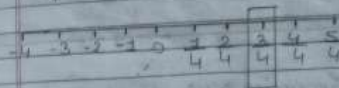
= $-\frac{33}{77}$ and $-\frac{35}{77}$

→ $-\frac{330}{770}$ and $-\frac{350}{770}$

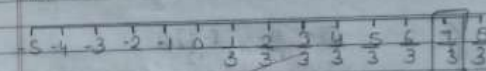
Ans → $-\frac{331}{770}, -\frac{333}{770}, -\frac{335}{770}, -\frac{337}{770}, -\frac{339}{770}$

Q.14 Represent the following on a number line.

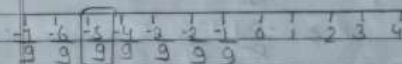
(a) $\frac{3}{4}$



(b) $\frac{7}{3}$



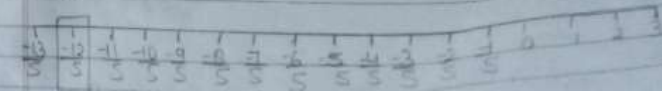
(c) $-\frac{5}{9}$



(d) $-\frac{8}{11}$



(e) $-\frac{12}{5}$



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$$(f) -\frac{1}{9}$$



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Exercise 4.2

Q.1 Evaluate:

$$(a) \frac{4}{11} + \frac{8}{11}$$

$$\Rightarrow \frac{4+8}{11}$$

$$\Rightarrow \frac{12}{11}$$

$$\text{Ans} \Rightarrow 1 \frac{1}{11}$$

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

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

$$\Rightarrow \frac{5-7}{12}$$

$$\Rightarrow \frac{-2}{12}$$

$$\text{Ans} \Rightarrow -\frac{1}{6}$$

$$(c) \frac{15}{19} + \frac{(-9)}{19}$$

$$\Rightarrow \frac{15+(-9)}{19}$$

$$\Rightarrow \frac{15-9}{19}$$

$$\Rightarrow \frac{6}{19}$$

$$(d) \frac{7}{13} - \frac{6}{13}$$

$$\Rightarrow \frac{7-6}{13}$$

$$\text{Ans} \Rightarrow \frac{1}{13}$$

$$(e) \frac{(-8)}{15} - \frac{(-7)}{15}$$

$$\Rightarrow \frac{-8}{15} - \frac{(-7)}{15}$$

$$\Rightarrow \frac{-8+7}{15}$$

$$\text{Ans} \Rightarrow -\frac{1}{15}$$

Q.2 Evaluate:

$$(a) \frac{9}{4} + \frac{8}{3}$$

$$\Rightarrow \frac{27+32}{12}$$

$$\Rightarrow \frac{59}{12}$$

$$\text{Ans} \Rightarrow 4 \frac{11}{12}$$

$$(b) \frac{12}{5} + \frac{(-13)}{6}$$

$$\Rightarrow \frac{72+(-65)}{30}$$

$$\Rightarrow \frac{72-65}{30}$$

$$\text{Ans} \Rightarrow \frac{7}{30}$$

$$(c) \frac{-16}{3} + \frac{(-15)}{4}$$

$$\Rightarrow \frac{-64+(-45)}{12}$$

$$\Rightarrow \frac{-64-45}{12}$$

$$\Rightarrow \frac{-109}{12}$$

$$\text{Ans} \Rightarrow 9 \frac{1}{12}$$

$$(d) \frac{44}{12} - \frac{36}{7}$$

$$\Rightarrow \frac{308-432}{84}$$

$$\Rightarrow \frac{-124}{84}$$

$$\Rightarrow \frac{-31}{21} \quad \text{Ans} \Rightarrow -1 \frac{10}{21}$$

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Q.3 Evaluate:

(a) $5 + \frac{3}{7} - (4 - \frac{2}{9})$

$\Rightarrow 5 + \frac{3}{7} - (\frac{36-2}{9})$

$\Rightarrow 5 + \frac{3}{7} - \frac{34}{9}$

$\Rightarrow \frac{315+27-238}{63}$

$\Rightarrow \frac{342-238}{63}$

$\Rightarrow \frac{104}{63}$

Ans. $\Rightarrow 1\frac{41}{63}$

(c) $9 - \frac{13}{7} - (\frac{2}{7} - \frac{12}{5})$

$\Rightarrow 9 - \frac{13}{7} - (\frac{10-84}{35})$

$\Rightarrow 9 - \frac{13}{7} - (\frac{-74}{35})$

$\Rightarrow 9 - \frac{13}{7} + \frac{74}{35}$

$\Rightarrow \frac{315-65+74}{35}$

$\Rightarrow \frac{315+74-65}{35}$

$\Rightarrow \frac{324-65}{35}$

$\Rightarrow \frac{259-65}{35}$

$\Rightarrow \frac{194}{35}$

Ans. $\Rightarrow 5\frac{9}{35}$

(b) $\frac{5}{4} - \frac{7}{6} - (-\frac{2}{9})$

$\Rightarrow \frac{5}{4} - \frac{7}{6} + \frac{2}{9}$

$\Rightarrow \frac{45-42+8}{36}$

$\Rightarrow \frac{45+8-42}{36}$

$\Rightarrow \frac{53-42}{36}$

Ans. $\Rightarrow \frac{11}{36}$

(d) $\frac{-4}{13} - (\frac{-9}{25}) - \frac{3}{10}$

$\Rightarrow \frac{-4}{13} + \frac{9}{25} - \frac{3}{10}$

$\Rightarrow \frac{-200+234-195}{650}$

$\Rightarrow \frac{-200-195+234}{650}$

$\Rightarrow \frac{-395+234}{650}$

$\Rightarrow \frac{-161}{650}$

Ans. $\Rightarrow \frac{-161}{650}$

$\Rightarrow \frac{-161}{650}$

$\Rightarrow \frac{-161}{650}$

Q.4 Add the difference of $\frac{2}{3}$ and $\frac{3}{5}$ to their sum.

[ATQ]

$\Rightarrow$ difference of $\frac{2}{3}$ and $\frac{3}{5}$

$\Rightarrow \frac{2}{3} - \frac{3}{5}$

$\Rightarrow \frac{10-9}{15}$

$\Rightarrow \frac{1}{15}$

$\Rightarrow$ sum of $\Rightarrow \frac{2}{3} + \frac{3}{5}$

$\Rightarrow \frac{10+9}{15}$

$\Rightarrow \frac{19}{15}$

$\Rightarrow$ Addition of $\Rightarrow \frac{1}{15} + \frac{19}{15}$

$\Rightarrow \frac{20}{15}$

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

Ans. $\Rightarrow \frac{4}{3}$

Q.5 What should be subtracted from $\frac{4}{7} - \frac{2}{3}$ to get $\frac{3}{5}$?

We should be subtracted $\Rightarrow (\frac{4}{7} - \frac{2}{3}) - \frac{3}{5}$

$\Rightarrow \frac{12-14}{21} - \frac{3}{5}$



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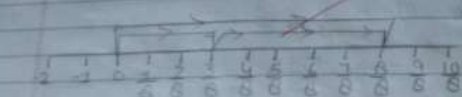
$$\Rightarrow \frac{-2}{21} - \frac{3}{5}$$

$$\Rightarrow \frac{-10 - 63}{105}$$

$$\Rightarrow \frac{-73}{105}$$

Ans: We should be subtracted $\Rightarrow \frac{-73}{105}$

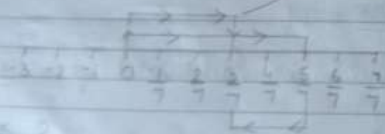
Q.6(a) Find $\frac{3}{8} + \frac{5}{8}$ on a number line.



$$\Rightarrow \frac{3+5}{8}$$

$$\text{Ans} \Rightarrow \frac{8}{8}$$

(b) Find $\frac{5}{7} - \frac{2}{7}$ on a number line.



$$\Rightarrow \frac{5-2}{7}$$

Q.7 Multiply:

(a) $\frac{-7}{81} \times \frac{-36}{49}$

$$\Rightarrow \frac{-7^1}{81} \times \frac{36^4}{49^7}$$

$$\text{Ans} \Rightarrow \frac{4}{63}$$

(c) $\frac{13}{60} \times \frac{105}{52}$

$$\Rightarrow \frac{13^1}{60} \times \frac{105^7}{52^4}$$

$$\text{Ans} \Rightarrow \frac{7}{16}$$

(e) $\frac{-125}{630} \times \frac{-497}{315}$

$$\Rightarrow \frac{-125^{25}}{630} \times \frac{-497^{71}}{315^{78}}$$

$$\text{Ans} \Rightarrow \frac{71}{210}$$

(b) $\frac{42}{64} \times \frac{-48}{35}$

$$\Rightarrow \frac{42^{83}}{64^{84}} \times \frac{-48^{63}}{35^5}$$

$$\text{Ans} \Rightarrow \frac{-9}{10}$$

(d) $\frac{51}{55} \times \frac{(-60)}{34}$

$$\Rightarrow \frac{51^3}{55^{12-6}} \times \frac{(-60)}{34}$$

$$\frac{-18}{11}$$

$$-1 \frac{7}{11}$$

(f) $\frac{32}{18} \times \frac{81}{88}$

$$\Rightarrow \frac{32^3}{18^2} \times \frac{81^9}{88^8}$$

$$\Rightarrow \frac{27}{16}$$

$$\text{Ans} \Rightarrow 1 \frac{11}{16}$$



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Q.8 Find the product.

(a) $4\frac{3}{8} \times (-5\frac{5}{5})$

$\Rightarrow \frac{35}{8} \times \frac{(-20)}{5}$

$\Rightarrow \frac{35^1}{8} \times \frac{-20^1}{5}$

$\Rightarrow \frac{-49}{2}$

Ans $\Rightarrow -24\frac{1}{2}$

(c) $-7\frac{2}{5} \times 5\frac{5}{7}$

$\Rightarrow \frac{-38}{5} \times \frac{40}{7}$

$\Rightarrow \frac{-304}{7}$

Ans $\Rightarrow -43\frac{3}{7}$

Q.9 Find the value of x if:

(a) $\frac{-9}{16} \times \frac{4}{3} = \frac{x}{2}$

$\Rightarrow \frac{-8^3}{16^4} \times \frac{4^1}{3^1} = \frac{x}{2}$

$\Rightarrow \frac{-3}{4} = \frac{x}{2}$

(b) $-3\frac{4}{7} \times 5\frac{4}{9}$

$\Rightarrow \frac{-27}{7} \times \frac{49}{9}$

$\Rightarrow \frac{-27^3}{7^1} \times \frac{49^1}{9^1}$

Ans $\Rightarrow -21$

(d) $-3\frac{2}{5} \times 4\frac{2}{7}$

$\Rightarrow \frac{-17}{5} \times \frac{30}{7}$

$\Rightarrow \frac{-102}{7}$

Ans $\Rightarrow -14\frac{4}{7}$

$\Rightarrow -3 \times 2 = 4 \times x$

$\Rightarrow \frac{-3 \times 2}{4} = x$

Ans $\Rightarrow \boxed{\frac{-3}{2} = x}$

(b) $\frac{-4}{27} \times \frac{109}{64} = \frac{x}{4}$

$\Rightarrow \frac{-4^1}{27^1} \times \frac{109^{2+7}}{64} = \frac{x}{4}$

$\Rightarrow \frac{-1}{16} = \frac{x}{4}$

$\Rightarrow -1 \times 4 = x \times 16$

$\Rightarrow \frac{-1 \times 4}{16^4} = x$

Ans $\Rightarrow \boxed{\frac{-1}{4} = x}$

Q.11 Find the reciprocal of:

(a) $\frac{8}{(-11)}$

Ans $\Rightarrow \frac{(-11)}{8}$

(b) $\frac{(-12)}{(-23)}$

Ans $\Rightarrow \frac{(-23)}{-12}$

Q.12 divide:

(a) $\frac{(-3)}{20} \div \frac{18}{80}$

$\Rightarrow \frac{-3}{20} \times \frac{80}{18}$

Ans $\Rightarrow \frac{-2}{3}$

(c) $\frac{(-4)}{13} \div \frac{(-16)}{39}$

$\Rightarrow \frac{-4}{13} \times \frac{39}{-16}$

Ans $\Rightarrow \frac{-3}{4}$

(e) $2\frac{2}{5} \div 6\frac{1}{2}$

$\Rightarrow \frac{13}{5} \times \frac{2}{13}$

$\Rightarrow \frac{2}{5}$

Ans $\Rightarrow \frac{2}{5}$

(b) $\frac{7}{25} \div \frac{(-21)}{10}$

$\Rightarrow \frac{7}{25} \times \frac{10}{(-21)}$

Ans $\Rightarrow \frac{2}{-15}$

(d) $\frac{4}{(-15)} \div \frac{48}{45}$

$\Rightarrow \frac{4}{-15} \times \frac{45}{48}$

Ans $\Rightarrow \frac{3}{-12}$

(f) $\frac{(-7)}{88} \div \frac{77}{(-121)}$

$\Rightarrow \frac{(-7)}{88} \times \frac{(-121)}{77}$

Ans $\Rightarrow \frac{1}{8}$

Q.13 What rational number should be divided by $\frac{6}{7}$ such that the result is $-\frac{49}{36}$?

$\Rightarrow$ We should divide $\Rightarrow \frac{6}{7} \div x = -\frac{49}{36}$

$\Rightarrow x = \frac{6}{7} \times \frac{36}{-49}$

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

Ans $\Rightarrow -\frac{7}{6}$ should be divided by $\frac{6}{7}$ to get $-\frac{49}{36}$

Q.14 The product of two rational numbers is $\frac{16}{5}$. One number is $-\frac{14}{5}$. Find the other number.

The product of two rational no. = $\frac{16}{5}$

One number = $-\frac{14}{5}$

Other number = $\frac{16}{5} \div -\frac{14}{5}$

$= \frac{16}{5} \times \frac{5}{-14}$

Ans: Other number = $-\frac{8}{7}$

Q.15 By which rational number should $\frac{13}{9}$ be multiplied to get $-\frac{3}{2}$?

Required no. = $-\frac{3}{2} \div \frac{13}{9}$

$= -\frac{3}{2} \times \frac{9}{13}$

Ans $\Rightarrow -\frac{27}{26}$

Ans Evaluate:

$$(a) \left(\frac{3}{-77} \times \frac{20}{27} \right) + \left(\frac{4}{-63} \times \frac{-102}{69} \right)$$

$$\Rightarrow \left(\frac{2^1 \times 2^2}{-77 \times 3^3} \right) + \left(\frac{4^1 \times (-102^2)}{-63 \times 69} \right)$$

$$\Rightarrow \frac{-2}{63} + \frac{2}{21}$$

$$\Rightarrow \frac{-2+6}{63}$$

$$\Rightarrow \frac{4}{63}$$

$$(b) \left(\frac{7}{16} \times \frac{-64}{42} \right) + \left(\frac{6}{-45} \times \frac{135}{126} \right)$$

$$\Rightarrow \frac{7^1 \times (-64^4)}{16^1 \times 42^2} + \left(\frac{6}{-45} \times \frac{135}{126} \right)$$

$$\Rightarrow \frac{-2}{3} + \left(\frac{-6^1 \times 135^8}{-45 \times 126} \right)$$

$$\Rightarrow \frac{-2}{3} + \frac{-1}{7}$$

$$\Rightarrow \frac{-14+(-3)}{21}$$

$$\Rightarrow \frac{-14-3}{21}$$

$$\text{Ans} \Rightarrow \frac{-17}{21}$$

$$(c) \left(\frac{12}{35} \times \frac{147}{44} \right) + \left(\frac{6}{-90} \div \frac{132}{36} \right) - \left(\frac{5}{24} \times \frac{72}{55} \right)$$

$$\Rightarrow \left(\frac{12}{35} \times \frac{147}{44} \right) + \left(\frac{6^1}{-90} \times \frac{36^1}{132} \right) - \left(\frac{5}{24} \times \frac{72}{55} \right)$$

$$\Rightarrow \left(\frac{12^3}{35} \times \frac{147}{44} \right) + \frac{-1}{55} - \left(\frac{5}{24} \times \frac{72}{55} \right)$$

$$\Rightarrow \frac{63}{55} + \frac{(-1)}{55} - \left(\frac{8^1}{24} \times \frac{72^3}{55} \right)$$

$$\Rightarrow \frac{63}{55} + \frac{(-1)}{55} - \frac{3}{11}$$

$$\Rightarrow \frac{63+(-1)-15}{55}$$

$$\Rightarrow \frac{63-1-15}{55}$$

$$\Rightarrow \frac{63-16}{55}$$

$$\text{Ans} \Rightarrow \frac{47}{55}$$



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$$(d) \left(\frac{15}{35} \times \frac{26}{24} \right) - \left[\left(\frac{16}{-21} \times \frac{69}{64} \right) - \left(\frac{5}{44} \div \frac{35}{99} \right) \right]$$

$$\Rightarrow \left(\frac{15}{35} \times \frac{26}{24} \right) - \left[\left(\frac{16}{-21} \times \frac{69}{64} \right) - \left(\frac{5}{44} \times \frac{99}{35} \right) \right]$$

$$\Rightarrow \left(\frac{15}{35} \times \frac{26}{24} \right) - \left[\left(\frac{16}{-21} \times \frac{69}{64} \right) - \frac{9}{28} \right]$$

$$\Rightarrow \left(\frac{15}{35} \times \frac{26}{24} \right) - \left[\frac{-23}{28} - \frac{9}{28} \right]$$

$$\Rightarrow \left(\frac{15}{35} \times \frac{26}{24} \right) - \left[\frac{-23-9}{28} \right]$$

$$\Rightarrow \left(\frac{15}{35} \times \frac{26}{24} \right) - \left(\frac{-32}{28} \right)$$

$$\Rightarrow \frac{13}{28} - \frac{(-32)}{28}$$

$$\Rightarrow \frac{13+32}{28}$$

$$\Rightarrow \frac{45}{28}$$

$$\text{Ans} \Rightarrow \frac{45}{28}$$

$$(e) \left(\frac{39}{120} \times \frac{75}{195} \right) + \left(\frac{112}{192} \div \frac{168}{-108} \right) - \left(\frac{275}{28} \times \frac{84}{660} \right)$$

$$\Rightarrow \left(\frac{39}{120} \times \frac{75}{195} \right) + \left(\frac{112}{192} \times \frac{-108}{168} \right) - \left(\frac{275}{28} \times \frac{84}{660} \right)$$

$$\Rightarrow \left(\frac{29}{120} \times \frac{75}{195} \right) + \frac{(-3)}{8} - \left(\frac{275}{28} \times \frac{84}{660} \right)$$

$$\Rightarrow \frac{1}{8} + \frac{(-3)}{8} - \left(\frac{275}{28} \times \frac{84}{660} \right)$$

$$\Rightarrow \frac{1}{8} + \frac{(-3)}{8} - \frac{5}{4}$$

$$\Rightarrow \frac{1+(-3)-10}{8}$$

$$\Rightarrow \frac{1-3-10}{8}$$

$$\Rightarrow \frac{1-13}{8}$$

$$\Rightarrow \frac{-12}{8}$$

$$\text{Ans} \Rightarrow \frac{-3}{2}$$



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$$(f) \left(\frac{13}{34} \times \frac{170}{78} \right) + \left(\frac{14}{35} \times \frac{(-245)}{56} \right) - \left(\frac{72}{132} \div \frac{18}{(-22)} \right)$$

$$\Rightarrow \left(\frac{13}{34} \times \frac{170}{78} \right) + \left(\frac{14}{35} \times \frac{(-245)}{56} \right) - \left(\frac{72}{132} \times \frac{(-22)}{18} \right)$$

$$\Rightarrow \left(\frac{13}{21} \times \frac{170}{78} \right) + \left(\frac{14}{35} \times \frac{(-245)}{56} \right) - \frac{(-2)}{3}$$

$$\Rightarrow \frac{5}{6} + \left(\frac{14}{35} \times \frac{(-245)}{56} \right) - \frac{(-2)}{3}$$

$$\Rightarrow \frac{5}{6} + \frac{(-7)}{4} - \frac{(-2)}{3}$$

$$\Rightarrow \frac{10 + (-21) - (-8)}{12}$$

$$\Rightarrow \frac{10 - 21 + 8}{12}$$

$$\Rightarrow \frac{10 + 8 - 21}{12}$$

$$\Rightarrow \frac{18 - 21}{12}$$

$$\Rightarrow \frac{-3}{12}$$

$$\Rightarrow -\frac{1}{4}$$

Q. 17 Find the rational number obtained when the $\left(\frac{3}{4} + \frac{4}{5} \right)$ is multiplied by $\left(\frac{3}{4} - \frac{4}{5} \right)$

$$\Rightarrow \frac{3}{4} + \frac{4}{5} \quad \Rightarrow \frac{3}{4} - \frac{4}{5}$$

$$\Rightarrow \frac{15+16}{20} \quad \Rightarrow \frac{15-16}{20}$$

$$\Rightarrow \frac{31}{20} \quad \Rightarrow \frac{-1}{20}$$

Multiplication

$$\Rightarrow \frac{31}{20} \times \frac{(-1)}{20}$$

$$\Rightarrow \frac{-31}{400}$$

Q. 18 A man rides a cycle at a speed of $63\frac{1}{3}$ km/h. Find the distance travelled in $2\frac{1}{3}$ hours.

A man rides a cycle at a speed $\Rightarrow 63\frac{1}{3}$ km/h

Time $\Rightarrow 2\frac{1}{3}$ hours

Distance $\Rightarrow \text{Speed} \times \text{Time}$

$$\Rightarrow 63\frac{1}{3} \times 2\frac{1}{3}$$

$$\Rightarrow \frac{190}{3} \times \frac{7}{3}$$



$$= 1330 \text{ km}$$

$$\text{Ans} \Rightarrow = 147 \frac{27}{99} \text{ km}$$

Q.19 It takes $\frac{141}{4}$ metres of cloth to make 15 shirts. Find the length required to make one shirt.

The length required to make = $\frac{141}{4}$ m
15 shirt

The length required to make = $\frac{141}{4} \div 15$
1 shirt

$$= \frac{47}{4} \times \frac{1}{15}$$

$$= \frac{47}{20}$$

$$\text{Ans} = 2 \frac{7}{20} \text{ m}$$

Q.20 Apsit — — — — — pen.

Apsit bought pens $\Rightarrow 16$
Total weight of 16 pen $\Rightarrow 266 \frac{2}{3} \text{ g}$

$$\Rightarrow \frac{800}{3} \text{ g}$$

Weight of single pen $\Rightarrow (\frac{800}{3} \div 16) \text{ g}$

$$\Rightarrow (\frac{800}{3} \times \frac{1}{16}) \text{ g}$$

$$\Rightarrow \frac{50}{3} \text{ g}$$

Ans $\Rightarrow$ Weight of single pen $\Rightarrow 16 \frac{2}{3} \text{ g}$

Q.21 Nikhil — — — — — writing?

Nikhil has written pages = $9 \frac{2}{5}$
 $= \frac{47}{5}$

He took time for 1 page = $\frac{1}{4}$ hrs
 $= \frac{5}{4}$ hrs

Hours he spent on writing = $(\frac{47}{5} \times \frac{5}{4})$ hrs
 $= \frac{47}{4}$ hrs

$$\text{Answer} \Rightarrow 11 \frac{3}{4} \text{ hrs}$$



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