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CLASS : V

SUBJECT : MATHEMATICS

CHAPTER NUMBER : 9

CHAPTER NAME : FRACTION

SUB-TOPIC : ADDITION OF FRACTIONS

EXERCISE 9 B Q.NO. 1

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Method:

Find the L.C.M. of the Denominators

Change the fractions to their equivalent fractions with common denominator

Then add

Example: 1

$$\frac{5}{6} + \frac{7}{12}$$

$$= \frac{5 \times 2 + 7 \times 1}{12} = \frac{10 + 7}{12} = \frac{17}{12}$$

3	6 , 12
2	2 , 4
	1 , 2

L.C.M. = 12

OR

$$\frac{5}{6} + \frac{7}{12}$$

L.C.M. = 12

$$\frac{5}{6} = \frac{10}{12} \quad \begin{matrix} \times 2 \\ \times 2 \end{matrix}$$

$$\frac{7}{12} = \frac{7}{12}$$

$$\frac{10}{12} + \frac{7}{12} = \frac{17}{12}$$

EXERCISE 9 B

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1. Add

a. $\frac{5}{6} + \frac{7}{12}$

$$\frac{5 \times 2 + 7 \times 1}{12} = \frac{10 + 7}{12} = \frac{17}{12}$$

3	6 , 12
2	2 , 4
	1 , 2

L.C.M. = 12

b. $\frac{4}{5} + \frac{3}{10} + \frac{1}{2}$

$$\frac{4 \times 2 + 3 \times 1 + 1 \times 5}{10}$$

$$= \frac{8 + 3 + 5}{10} = \frac{16}{10}$$

2	5 , 10 , 2
5	5 , 5 , 1
	1 , 1 , 1

L.C.M. = 10

EXERCISE 9 B

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c. $\frac{5}{6} + \frac{7}{12} + \frac{5}{24}$

2	6 , 12 , 24
3	3 , 6, 12
2	1 , 2 , 4
	1 , 1 , 2

$\frac{5}{6} = \frac{20}{24}$

$\frac{7}{12} = \frac{14}{24}$

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

L.C.M. = 24

$\frac{20}{24} + \frac{14}{24} + \frac{5}{24} = \frac{39}{24}$

EXERCISE 9 B

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d. $\frac{2}{7} + \frac{3}{5} + \frac{1}{2}$

$$\frac{2 \times 10 + 3 \times 14 + 1 \times 35}{70}$$

$$= \frac{20 + 42 + 35}{70} = \frac{97}{70}$$

L.C.M. = 2 × 5 × 7 = 70
As 2 , 5 and 7 are prime numbers.

LEARNING OUTCOME :

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The students are able

- **To add unlike fractions and mixed numbers.**

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CLASS : V

SUBJECT : MATHEMATICS

CHAPTER NUMBER : 9

CHAPTER NAME : FRACTION

SUB-TOPIC : SUBTRACTION OF FRACTIONS

EXERCISE 9 B Q.NO. 2

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Method:

Find the L.C.M. of the Denominators

Change the fractions to their equivalent fractions with common denominator

Then subtract.

Example: 1

$$\frac{8}{15} - \frac{4}{9}$$

$$= \frac{8 \times 3 - 4 \times 5}{45}$$

$$= \frac{24 - 20}{45}$$

$$= \frac{4}{45}$$

3	9 , 15
3	3 , 5
	1 , 5

L.C.M. = 45

EXERCISE 9 B

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2. Subtract

a. $\frac{8}{15} - \frac{4}{9}$

$= \frac{8 \times 3 - 4 \times 5}{45} = \frac{24 - 20}{45} = \frac{4}{45}$

3	9 , 15
3	3 , 5
	1 , 5

L.C.M. = 45

b. $\frac{11}{13} - \frac{5}{7}$

$\frac{11 \times 7 - 5 \times 13}{91}$

$= \frac{77 - 65}{91} = \frac{12}{91}$

L.C.M. = 13 × 7 = 91
As 11, 7 are prime numbers.

EXERCISE 9 B

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c. $\frac{13}{17} - \frac{7}{10}$

L.C.M. = 17 × 10 = 170

$$\frac{13 \times 10 - 7 \times 17}{170}$$

$$= \frac{130 - 119}{170} = \frac{11}{170}$$

EXERCISE 9 B

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d. $\frac{15}{19} - \frac{9}{13}$

L.C.M. = 19 × 13 = 247

$$\frac{15 \times 13 - 9 \times 19}{247}$$

$$= \frac{195 - 171}{247} = \frac{24}{247}$$

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- **Complete exercise 9 B Q.No 2 bit j and k in the notebook.**

LEARNING OUTCOME :

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The students are able

- **To subtract unlike fractions and mixed numbers.**

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CLASS : V

SUBJECT : MATHEMATICS

CHAPTER NUMBER: 9

CHAPTER NAME : FRACTION

SUB-TOPIC : SIMPLIFICATION OF FRACTIONS

EXERCISE 9 B Q.NO. 3

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SIMPLIFICATION OF FRACTIONS

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Example: 1

$$\frac{4}{9} + \frac{5}{6} - \frac{2}{3}$$

Arrange the fractions with [+] sign together and then fractions with [–]sign.

$$= \frac{4 \times 2 + 5 \times 3 - 2 \times 6}{18}$$

$$= \frac{8 + 15 - 12}{18}$$

$$= \frac{11}{18}$$

3	9 , 6, 3
3	3 , 2 , 1
	1 , 2, 1

L.C.M. = 18

Exercise : 9 B

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3. Simplify

b. $\frac{9}{10} - \frac{3}{5} + \frac{7}{8} = \frac{9}{10} + \frac{7}{8} - \frac{3}{5}$

L.C.M. = 40

$= \frac{9 \times 4 + 7 \times 5 - 3 \times 8}{40}$

$= \frac{36 + 35 - 24}{40} = \frac{71 - 24}{40} = \frac{47}{40} = 1\frac{7}{40}$

Exercise : 9 B

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c. $\frac{5}{12} - \frac{2}{3} - \frac{1}{2} + 7$

$= \frac{5}{12} + \frac{7}{1} - \frac{2}{3} - \frac{1}{2}$

$= \frac{5 + 7 \times 12 - 2 \times 4 - 1 \times 6}{12}$ [L.C.M. = 12]

$= \frac{5 + 84 - 8 - 6}{12}$

$= \frac{89 - 14}{12} = \frac{75}{12} = 6\frac{3}{12}$

Exercise : 9 B

e. $8\frac{3}{4} + 7\frac{1}{2} - 3\frac{1}{4} - 2\frac{1}{2}$

$= \frac{35}{4} + \frac{15}{2} - \frac{13}{4} - \frac{5}{2}$

$= \frac{35 + 15 \times 2 - 13 - 5 \times 2}{4}$ [L.C.M. = 4]

$= \frac{35 + 30 - 13 - 10}{4}$

$= \frac{65 - 23}{4} = \frac{42}{4} = 10\frac{2}{4}$

Exercise : 9 B

f. $10\frac{5}{6} - 7\frac{2}{3} + 8\frac{1}{3} - 5\frac{1}{2}$

$= \frac{65}{6} + \frac{25}{3} - \frac{23}{3} - \frac{11}{2}$

$= \frac{65 + 25 \times 2 - 23 \times 2 - 11 \times 3}{6}$ [L.C.M. = 6]

$= \frac{65 + 50 - 46 - 33}{6}$

$= \frac{115 - 79}{6} = \frac{36}{6} = 6$

LEARNING OUTCOME:

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Students are able

- **To simplify a fraction**
- **To reduce to their lowest term**
- **To perform 2 operations at one time.**

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CLASS : V

SUBJECT : MATHEMATICS

CHAPTER NUMBER: 9

CHAPTER NAME : FRACTION

SUB-TOPIC : MULTIPLICATION OF FRACTIONS

EXERCISE 9 C

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Multiplication of Fractions

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Multiply the numerators

$$\frac{2}{5} \times \frac{3}{4} = \frac{6}{\ }$$

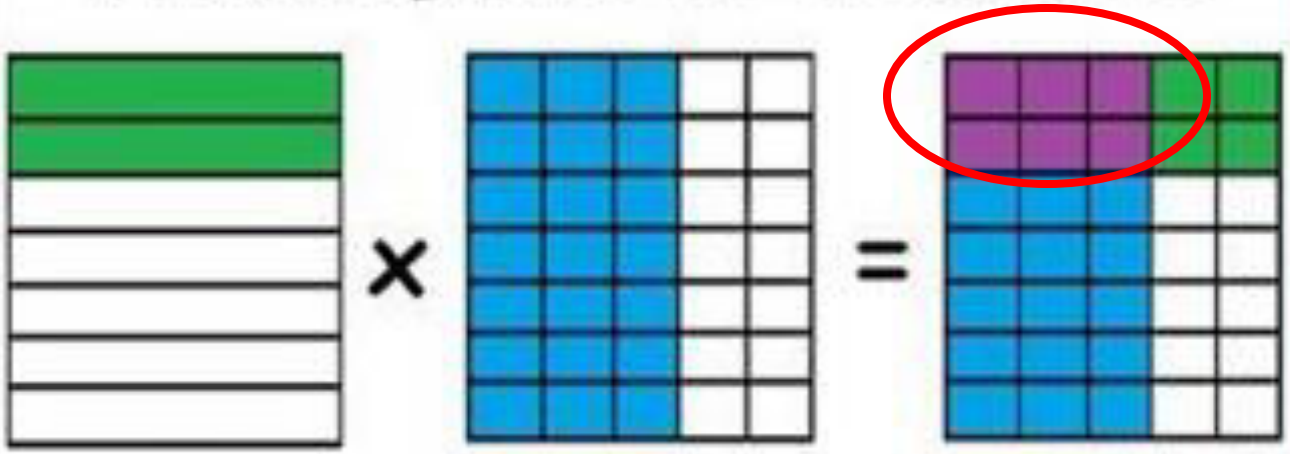
Multiply the denominators

$$\frac{2}{5} \times \frac{3}{4} = \frac{6}{20}$$

Reduce the fraction if necessary

$$\frac{6}{20} = \frac{3}{10}$$

Multiplying Fractions



$$\frac{2}{7} \times \frac{3}{5} = \frac{6}{35}$$

Multiplication of Fractions

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Example: 1

$$\frac{8}{15} \times \frac{2}{3}$$

$$= \frac{8 \times 2}{15 \times 3} = \frac{\mathbf{16}}{\mathbf{45}}$$

Multiplication of Fractions

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Example: 2

$$3\frac{5}{7} \times 2\frac{4}{5}$$

$$= \frac{26}{\cancel{7}} \times \frac{\cancel{14}^{2}}{5}$$

$$= \frac{52}{5} = 10\frac{2}{5}$$

Properties of Multiplication

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Changing the order of the numbers doesn't change the product.

The product of a fraction and 0 is 0.

The product of a fraction and 1 of the fraction itself.

EXERCISE : 9 C

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1. Multiply

a. $\frac{5}{28} \times 7$

$$= \frac{5 \times \cancel{7}}{\cancel{28}_{4} \times 1} = \frac{\mathbf{5}}{\mathbf{4}} = \mathbf{1\ \frac{1}{4}}$$

c. $\frac{4}{5} \times \frac{11}{16} \times \frac{5}{8}$

$$= \frac{\cancel{4} \times 11 \times \cancel{5}}{\cancel{5} \times \cancel{16}_{\mathbf{4}} \times 8} = \frac{\mathbf{11}}{\mathbf{32}}$$

EXERCISE : 9 C

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1. Multiply

d. $\frac{17}{24} \times \frac{3}{34} \times \frac{6}{7}$

$= \frac{\cancel{17}^{1} \times 3 \times \cancel{6}^{2}}{\cancel{24}_{4} \times \cancel{34}_{2} \times 7} = \frac{3}{56}$

f. $\frac{4}{5} \times 1\frac{6}{7} \times 0 = 0$

EXERCISE : 9 C

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1. Multiply

g. $\frac{1}{4} \times 2\frac{1}{2} \times \frac{4}{5} \times 3\frac{1}{2} \times \frac{4}{5}$

$= \frac{1}{\cancel{4}} \times \frac{\cancel{5}}{\cancel{2}} \times \frac{\cancel{4}}{\cancel{5}} \times \frac{7}{\cancel{2}} \times \frac{\cancel{2}}{\cancel{4}}$

$= \frac{7}{5} = 1\frac{2}{5}$

Students are able to multiply a fraction by another fraction and reduce the same to its lowest term.

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CLASS : V

SUBJECT : MATHEMATICS

CHAPTER NUMBER: 9

CHAPTER NAME : FRACTION

SUB-TOPIC : DIVISION OF FRACTIONS

EXERCISE 9 D

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Division of Fractions

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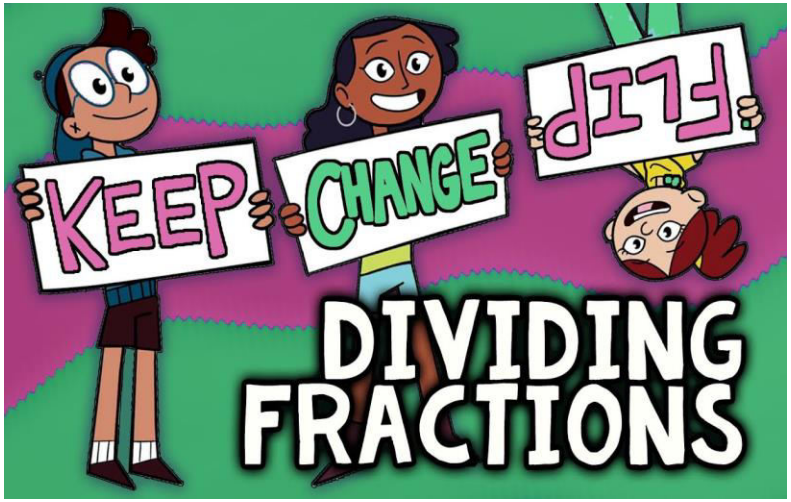

EXAMPLE 1

KEEP CHANGE FLIP

$$\frac{2}{9} \div \frac{1}{3}$$

$$\frac{2}{\cancel{9}_{3}} \times \frac{\cancel{3}}{1} = \frac{2}{3}$$

Division of Fractions

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Example: 1

$$\frac{1}{3} \div 2$$

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

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Division of Fractions

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Example: 2

$$2\frac{19}{26} \div 16\frac{5}{13} = \frac{71}{26} \div \frac{213}{13}$$

$$= \frac{71 \times 13}{26 \times 213} = \frac{1}{6}$$

2 3

Division of Fractions

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Example: 3

Write the quotient in its simplest form

$$\frac{\frac{6}{7}}{\frac{18}{35}}$$

Reciprocal of $\frac{18}{35} = \frac{35}{18}$

$$= \frac{\cancel{6}^{\,2}}{\cancel{7}_{\,1}} \times \frac{\cancel{35}^{\,5}}{\cancel{18}_{\,3}}$$

$$= \frac{5}{3} = 1\frac{2}{3}$$

EXERCISE : 9 D

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1. Divide:

a. $\frac{35}{44} \div 70$

$$= \frac{\cancel{35}^{1} \times 1}{44 \times \cancel{70}_{2}} = \frac{1}{88}$$

b. $\frac{12}{13} \div 15$

$$= \frac{\cancel{12}^{4} \times 1}{13 \times \cancel{15}_{5}} = \frac{4}{65}$$

EXERCISE : 9 D

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1. Divide:

j. $\frac{3}{4} \div \frac{1}{2} \div \frac{6}{7}$

$$= \frac{\cancel{3}^{\,1} \times \cancel{2}^{\,1} \times 7}{\cancel{4}^{\,2} \times 1 \times \cancel{6}^{\,2}} = \frac{7}{4} = 1\frac{3}{4}$$

k. $2\frac{1}{4} \div 1\frac{3}{10} \div \frac{3}{13} = \frac{9}{4} \div \frac{13}{10} \div \frac{3}{13}$

$$= \frac{\cancel{9}^{\,3} \times \cancel{10}^{\,5} \times \cancel{13}^{\,1}}{\cancel{4}^{\,2} \times \cancel{13}^{\,1} \times \cancel{3}^{\,1}} = \frac{15}{2} = 7\frac{1}{2}$$

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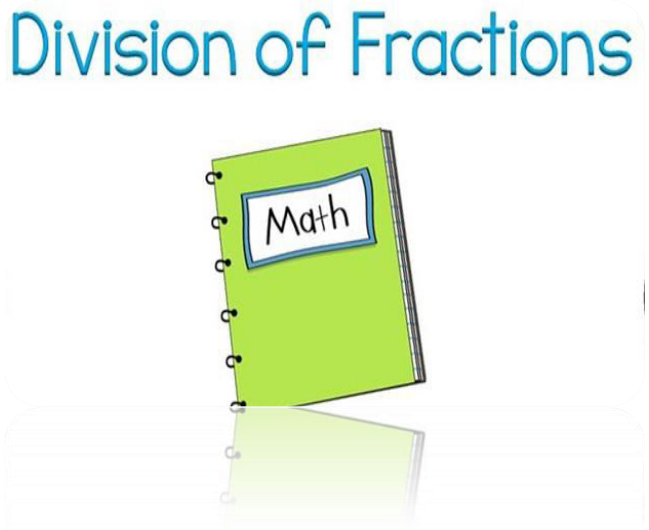
- **Complete exercise 9 D Q.No.1 bit f and g in the notebook.**



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Students are able to divide a fraction by another fraction and reduce the same to its lowest term.

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CLASS : V

SUBJECT : MATHEMATICS

CHAPTER NUMBER: 9

CHAPTER NAME : FRACTION

SUB-TOPIC : DIVISION OF FRACTIONS

EXERCISE 9 D

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EXERCISE : 9 D

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2. Find the quotient in its simplest form

a. $\dfrac{\frac{3}{5}}{\frac{7}{10}}$

$= \dfrac{3}{\cancel{5}_{1}} \times \dfrac{\cancel{10}^{2}}{7} = \dfrac{6}{7}$

Reciprocal of $\dfrac{7}{10} = \dfrac{10}{7}$

b. $\dfrac{\frac{5}{16}}{\frac{9}{14}}$

$= \dfrac{5}{\cancel{16}_{8}} \times \dfrac{\cancel{14}^{7}}{9} = \dfrac{35}{72}$

EXERCISE : 9 D

2. Find the quotient in its simplest form

j $\dfrac{10}{1\frac{2}{3}} = \dfrac{10}{1} \div \dfrac{5}{3}$

$= \dfrac{\cancel{10}^{2}}{1} \times \dfrac{3}{\cancel{5}} = 6$

k $\dfrac{24}{3\frac{1}{3}} = \dfrac{24}{1} \div \dfrac{10}{3}$

$= \dfrac{\cancel{24}^{12}}{1} \times \dfrac{3}{\cancel{10}_{5}} = \dfrac{36}{5} = 7\dfrac{1}{5}$

EXERCISE – 9 D

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3. A train covered $36\frac{3}{4}$ km in the 1st hour, $40\frac{2}{5}$ km in the 2nd hour and **38** km in 3rd hour. Find the total distance covered by the train in 3 hours.

Solution

Distance covered in 1st hour= $36\frac{3}{4}$ km

Distance covered in 2nd hour= $40\frac{2}{5}$ km

Distance covered in 3rd hour= 38 km

Total distance covered= $36\frac{3}{4} + 40\frac{2}{5} + \frac{38}{1} = \frac{147}{4} + \frac{202}{5} + \frac{38}{1}$

$$= \frac{147 \times 5 + 202 \times 4 + 38 \times 20}{20}$$

EXERCISE – 9 D

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$$= \frac{735 + 808 + 760}{20} = \frac{2303}{20} = 115\ \frac{3}{20}$$

$\therefore$ total distance covered in 3 hour is $\mathbf{115\ \frac{3}{20}}$ km.

EXERCISE – 9 D

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4. Rakesh spent $1\frac{1}{4}$ hours to finish Math homework, $1\frac{3}{4}$ hours to do his science homework and $\frac{3}{4}$ hours to do his English homework. How long did he take to complete his homework?

Solution

Time spent for Math h.w = $1\frac{1}{4} = \frac{5}{4}$ hours

Time spent for science h.w = $1\frac{3}{4} = \frac{7}{4}$ hours

Time spent for English h.w = $\frac{3}{4}$ hours

Total time spent = $\frac{5}{4} + \frac{7}{4} + \frac{3}{4} = \frac{15}{4} = 3\frac{3}{4}$

∴He spent $3\frac{3}{4}$ hours to complete his homework.

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Students are able to divide a fraction by another fraction and reduce the same to its lowest term.

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CLASS : V

SUBJECT : MATHEMATICS

CHAPTER NUMBER: 9

CHAPTER NAME : FRACTION

SUB-TOPIC : WORD PROBLEMS OF FRACTIONS

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EXERCISE – 9 D

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5. The distance between two places is 100 km. Anil travelled first $33\frac{2}{3}$ km by bus and remaining distance by train.

Find the distance Anil travelled by train.

Solution

Total distance = 100 km

Distance travelled by bus = $33\frac{2}{3}$ km

Distance travelled by train = $100 - 33\frac{2}{3}$

$$= \frac{100}{1} - \frac{101}{3} = \frac{3 \times 100 - 101}{3}$$

$$= \frac{300 - 101}{3} = \frac{199}{3} = 66\frac{1}{3}$$

∴ **He travelled $66\frac{1}{3}$ km by train.**

EXERCISE 9 D

ODM EDUCATIONAL GROUP
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7. Find the distance covered by a bus in $4\frac{1}{2}$ hours if the speed of the bus is $30\frac{6}{7}$ km per hour.

Solution

Distance covered in an hour = $30\frac{6}{7}$ km.

Distance covered in $4\frac{1}{2}$ hours = $30\frac{6}{7} \times 4\frac{1}{2}$

$$= \frac{\overset{108}{\cancel{216}}}{7} \times \frac{9}{\cancel{2}}$$

$$= \frac{972}{7} = 138\frac{6}{7}$$

∴ **Total distance covered in $4\frac{1}{2}$ hrs is $138\frac{6}{7}$ km.**

EXERCISE 9 D

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9. If $54\frac{1}{2}$ kg rice is distributed among 66 poor people. Find how much rice each one gets.

SOLUTION:

No. of people = 66

Total quantity of rice = $54\frac{1}{2}$ kg.

Each person gets = $54\frac{1}{2} \div 66 = \frac{109}{2} \div \frac{66}{1}$

$= \frac{109}{2} \times \frac{1}{66} = \frac{109}{132}$ kg

∴ Each person gets $\frac{109}{132}$ kg of rice.

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Students are able to write the statements of story sums of fraction and identify the operations to be followed to find the answers.

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