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## Chapter-2: Fractions and Decimals

### Exercise 2.1 (Page 31)

**Q1.** Solve: -

a)  $2 - \frac{3}{5}$

b)  $4 + \frac{7}{8}$

c)  $\frac{3}{5} + \frac{2}{7}$

d)  $\frac{9}{11} - \frac{4}{15}$

e)  $\frac{7}{10} + \frac{2}{5} + \frac{3}{2}$

f)  $2\frac{2}{3} + 3\frac{1}{2}$

g)  $8\frac{1}{2} - 3\frac{5}{8}$

**Difficulty Level:** Low

**What is known:**

Expression in unlike fraction.

**What is unknown:**

Sum/difference.

**Reasoning:**

Convert following fractions into like fraction (fractions with same denominator) then find sum or difference by adding or subtracting numerator.

**Solution:**

a)

$$2 - \frac{3}{5} = \frac{2}{1} - \frac{3}{5} = \frac{10-3}{5} = \frac{7}{5} \text{ (improper fraction)}$$

Converting into mixed fraction, we get

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

b)

$$4 + \frac{7}{8} = \frac{4}{1} + \frac{7}{8} = \frac{32+7}{8} = \frac{39}{8} \text{ (improper fraction)}$$

Converting into mixed fraction, we get

$$= 4\frac{7}{8}$$

c)

$$\frac{3}{5} + \frac{2}{7} = \frac{21+10}{35} = \frac{31}{35}$$

d)  $\frac{9}{11} - \frac{4}{15} = \frac{135-44}{165} = \frac{91}{165}$

e)

$$\frac{7}{10} + \frac{2}{5} + \frac{3}{2} = \frac{7+4+15}{10} = \frac{26}{10} = \frac{13}{5} \text{ (improper fraction)}$$

Converting into mixed fraction, we get

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

f)

$$2\frac{2}{3} + 3\frac{1}{2} = \frac{8}{3} + \frac{7}{2} = \frac{16+21}{6} = \frac{37}{6} \text{ (improper fraction)}$$

Converting into mixed fraction, we get

$$= 6\frac{1}{6}$$

g)

$$8\frac{1}{2} - 3\frac{5}{8} = \frac{17}{2} - \frac{29}{8} = \frac{68-29}{8} = \frac{39}{8} \text{ (improper fraction)}$$

Converting into mixed fraction, we get

$$= 4\frac{7}{8}$$

**Q2.** Arrange the following in descending order: -

i)  $\frac{2}{9}, \frac{2}{3}, \frac{8}{21}$

ii)  $\frac{1}{5}, \frac{3}{7}, \frac{7}{10}$

**Difficulty Level: Medium**

**What is given/known?**

Unlike fractions

**What is the unknown?**

Descending order of the given fractions.

**Reasoning:**

Convert the given fractions into like fractions so that all of them have the same denominator. Now the fractions can be easily arranged into descending order by comparing their numerators.

**Solution:**

i)

$$\frac{2}{9}, \frac{2}{3}, \frac{8}{21}$$

Converting them into like fractions, we get

$$\begin{aligned} & \frac{2 \times 7}{9 \times 7}, \frac{2 \times 21}{3 \times 21}, \frac{8 \times 3}{21 \times 3} \\ \Rightarrow & \frac{14}{63}, \frac{42}{63}, \frac{24}{63} \end{aligned}$$

Arranging in descending order

$$\Rightarrow \frac{42}{63} > \frac{24}{63} > \frac{14}{63}$$

Therefore,  $\frac{2}{3} > \frac{8}{21} > \frac{2}{9}$

ii)

$$\frac{1}{5}, \frac{3}{7}, \frac{7}{10}$$

(converting them into like fractions, we get)

$$\begin{aligned} & \frac{1 \times 14}{5 \times 14}, \frac{3 \times 10}{7 \times 10}, \frac{7 \times 7}{10 \times 7} \\ \Rightarrow & \frac{14}{70}, \frac{30}{70}, \frac{49}{70} \end{aligned}$$

Arranging in descending order

$$\Rightarrow \frac{49}{70} > \frac{30}{70} > \frac{14}{70}$$

Therefore,  $\frac{7}{10} > \frac{3}{7} > \frac{1}{5}$ .

**Q3.** In a “magic square”, the sum of the numbers in each row, in each column and along the diagonals is the same. Is this a magic square?

$$\begin{array}{ccc} \frac{4}{11} & \frac{9}{11} & \frac{2}{11} \\ \frac{3}{11} & \frac{5}{11} & \frac{7}{11} \\ \frac{8}{11} & \frac{1}{11} & \frac{6}{11} \end{array}$$

**Difficulty Level: Medium**

**What is given/known?**

A square with three rows and three columns

**What is the unknown?**

If the square is a magic square or not.

**Reasoning**

As stated in the question, in a magic square, the sum of the numbers in each row, in each column and along the diagonals is the same. We can add the fractions in all rows, columns and diagonals to see if sum is the same or not.

**Sum of rows:**

$$\begin{aligned}\text{Sum of first row} &= \frac{4}{11} + \frac{9}{11} + \frac{2}{11} \\ &= \frac{4+9+2}{11} \\ &= \frac{15}{11}\end{aligned}$$

$$\begin{aligned}\text{Sum of second row} &= \frac{3}{11} + \frac{5}{11} + \frac{7}{11} \\ &= \frac{3+5+7}{11} \\ &= \frac{15}{11}\end{aligned}$$

$$\begin{aligned}\text{Sum of third row} &= \frac{8}{11} + \frac{1}{11} + \frac{6}{11} \\ &= \frac{8+1+6}{11} \\ &= \frac{15}{11}\end{aligned}$$

**Sum of columns:**

$$\begin{aligned}\text{Sum of first column} &= \frac{4}{11} + \frac{3}{11} + \frac{8}{11} \\ &= \frac{4+3+8}{11} \\ &= \frac{15}{11}\end{aligned}$$

$$\begin{aligned}\text{Sum of second column} &= \frac{9}{11} + \frac{5}{11} + \frac{1}{11} \\ &= \frac{9+5+1}{11} \\ &= \frac{15}{11}\end{aligned}$$

$$\begin{aligned}\text{Sum of third column} &= \frac{2}{11} + \frac{7}{11} + \frac{6}{11} \\ &= \frac{2+7+6}{11} \\ &= \frac{15}{11}\end{aligned}$$

$$\begin{aligned}\text{Sum of first diagonal} &= \frac{4}{11} + \frac{5}{11} + \frac{6}{11} \\ &= \frac{4+5+6}{11} \\ &= \frac{15}{11}\end{aligned}$$

$$\begin{aligned}\text{Sum of second diagonal} &= \frac{2}{11} + \frac{5}{11} + \frac{8}{11} \\ &= \frac{2+5+8}{11} \\ &= \frac{15}{11}\end{aligned}$$

Since, the sum of fractions in each row, column, and along the diagonal is the same, therefore, the given square is a magic square.

**Q4.** A rectangular sheet of paper is  $12\frac{1}{2}$  cm long and  $10\frac{2}{3}$  cm wide. Find its perimeter.

**Difficulty Level:** Easy

**What is given/known?**

Length and breadth of a rectangular sheet of paper.

**What is the unknown?**

Perimeter of the sheet.

**Reasoning:**

Perimeter of a rectangle can be calculated easily by adding lengths of four sides of the rectangle.

**Solution:**

$$\text{Length of rectangular sheet} = 12\frac{1}{2} \text{ cm} = \frac{25}{2} \text{ cm}$$

$$\text{Breadth of rectangular sheet} = 10\frac{2}{3} \text{ cm} = \frac{32}{3} \text{ cm}$$

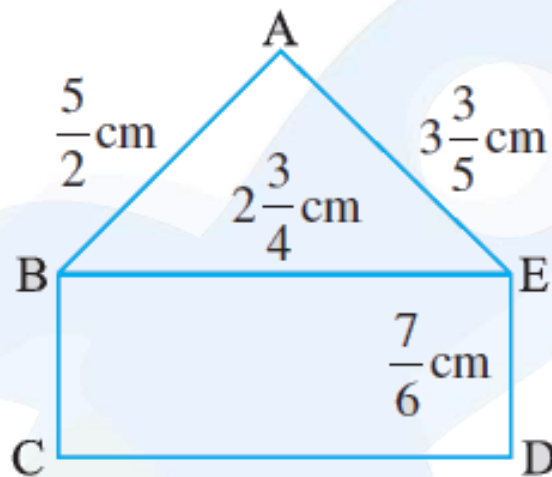
We know that, perimeter of rectangle = 2 (Length + Breadth)

$$\begin{aligned}&= 2 \left( \frac{25}{2} + \frac{32}{3} \right) \\ &= 2 \left( \frac{25 \times 3 + 32 \times 2}{2 \times 3} \right)\end{aligned}$$

$$\begin{aligned}
 &= 2 \left( \frac{75 + 64}{6} \right) \\
 &= 2 \left( \frac{139}{6} \right) \\
 &= 2 \times \left( \frac{139}{6} \right) \\
 &= 46 \frac{1}{3} \text{ cm}
 \end{aligned}$$

Therefore, perimeter of rectangular sheet of the paper is  $46 \frac{1}{3}$  cm.

**Q5.** Find the perimeter of i)  $\triangle ABE$  ii) The rectangle BCDE in this figure.  
Whose perimeter is greater?



**Difficulty Level: Moderate**

**What is given/known?**

A rectangle and a triangle

**What is the unknown?**

Perimeter of the given rectangle and triangle.

**Reasoning:**

Perimeters of the rectangle and triangle can be calculated by adding lengths of four sides of the rectangle and the three sides of the triangle. Perimeters can be compared to decide whose perimeter is greater.

**Solution:**

i) Perimeter of  $\triangle ABE$  = sum of all sides =  $AB + BE + AE$

$$= \frac{5}{2} \text{ cm} + 2\frac{3}{4} \text{ cm} + 3\frac{3}{5} \text{ cm}$$

$$= \left( \frac{5}{2} + 2\frac{3}{4} + 3\frac{3}{5} \right) \text{ cm}$$

$$\begin{aligned}
 &= \left( \frac{5}{2} + \frac{11}{4} + \frac{18}{5} \right) \text{cm} \\
 &= \left( \frac{50 + 55 + 72}{20} \right) \text{cm} \\
 &= \frac{177}{20} \text{cm} \\
 &= 8 \frac{17}{20} \text{cm}
 \end{aligned}$$

Therefore, perimeter of  $\triangle ABE$  is  $8 \frac{17}{20}$  cm

ii) In rectangle, BCDE

$$BE = 2 \frac{3}{4} \text{cm}, \quad ED = \frac{7}{6} \text{cm}$$

Perimeter of rectangle BCDE = 2 (Length + Breadth)

$$\begin{aligned}
 &= 2 \left( 2 \frac{3}{4} + \frac{7}{6} \right) \\
 &= 2 \left( \frac{11}{4} + \frac{7}{6} \right) \\
 &= 2 \left( \frac{66 + 28}{24} \right) \\
 &= 2 \left( \frac{94}{24} \right) \\
 &= \frac{47}{6} \\
 &= 7 \frac{5}{6} \text{cm}
 \end{aligned}$$

Therefore, perimeter of rectangle BCDE is  $7 \frac{5}{6}$  cm.

On comparing,

$$8 \frac{17}{20} \text{cm} > 7 \frac{5}{6} \text{cm}$$

Therefore, perimeter of  $\triangle ABE$  is greater than the perimeter of rectangle BCDE.

**Q6.** Salil wants to put a picture in a frame. The picture is  $7 \frac{3}{5}$  cm wide. To fit in the frame the picture cannot be more than  $7 \frac{3}{10}$  cm wide. How much the picture should be trimmed?

**Difficulty Level: Moderate**



**What is given/known?**

Width of the picture and frame.

**What is the unknown?**

The frame width is smaller than that the width of the picture. How much the picture should be trimmed so that it fits into the frame.

**Reasoning:**

Since width of the picture is more, it should be trimmed to make its width equal to the width of the frame. How much picture should be trimmed can be obtained by subtracting width of the frame from the width of the picture.

**Solution:**

$$\text{The width of the picture} = 7\frac{3}{5}\text{ cm} = \frac{38}{5}\text{ cm}$$

$$\text{Width of the picture frame} = 7\frac{3}{10}\text{ cm} = \frac{73}{10}\text{ cm}$$

$$\begin{aligned}\text{Therefore, the picture should be trimmed} &= 7\frac{3}{5}\text{ cm} - 7\frac{3}{10}\text{ cm} \\ &= \frac{38}{5}\text{ cm} - \frac{73}{10}\text{ cm} \\ &= \left(\frac{76-73}{10}\right)\text{ cm} \\ &= \frac{3}{10}\text{ cm}\end{aligned}$$

Thus, the picture should be trimmed  $\frac{3}{10}$  cm to fit in the picture.

- Q7.** Ritu ate  $\frac{3}{5}$  part of an apple and the remaining part was eaten by his brother Somu. How much part of the apple Somu eat? Who has the larger share? By how much?

**Difficulty Level: Low****What is given/known?**

Parts (fraction) of the apple which Ritu ate.

**What is the unknown?**

Who ate the larger part of the apple and by how much.

**Reasoning:**

Compare the fractions and decide which one is larger.

**Solution:**

$$\text{Part (fraction) of apple eaten by Ritu} = \frac{3}{5}$$



Part of apple eaten by Somu = 1 – Part of apple eaten by Ritu

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

Since  $\frac{3}{5} > \frac{2}{5}$ , Ritu ate larger share.

$$\text{Difference between their shares} = \frac{3}{5} - \frac{2}{5}$$
$$= \frac{1}{5}$$

Thus, Ritu's part is  $\frac{1}{5}$  more than Somu's part.

**Q8.** Michael finished coloring picture in  $\frac{7}{12}$  hour. Vaibhav finished coloring the same picture in  $\frac{3}{4}$  hour. Who worked longer? By what fraction was it longer?

**Difficulty Level: Easy**

**What is given/known?**

Time taken by Michael and Vaibhav to finish coloring the picture.

**What is the unknown?**

Who took longer to finish colouring the picture and how much longer.

**Reasoning:**

Time is given in unlike fractions. The first step is to change the fractions to like fractions and compare them to decide which one is bigger.

**Solution:**

$$\text{Time taken by Michael} = \frac{7}{12} \text{ hour}$$

$$\text{Time taken by Vaibhav} = \frac{3}{4} \text{ hour}$$

$$= \frac{3 \times 3}{4 \times 3} \text{ (converting into like fractions)}$$

$$= \frac{9}{12} \text{ hour}$$

Since,  $\frac{9}{12} > \frac{7}{12}$  therefore, Vaibhav worked longer.

$$\text{Difference} = \frac{9}{12} - \frac{7}{12} = \frac{2}{12} = \frac{1}{6} \text{ hour}$$

Thus, Vaibhav took  $\frac{1}{6}$  hour more than Michael.

## Chapter-2: Fractions and Decimals

### Exercise 2.2 (Page 36)

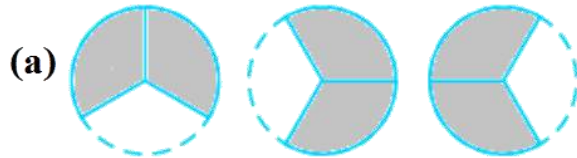
**Q1.** Which of the drawing (a) to (d) show:

i)  $2 \times \frac{1}{5}$

ii)  $2 \times \frac{1}{2}$

iii)  $3 \times \frac{2}{3}$

iv)  $3 \times \frac{1}{4}$



**Difficulty Level:** Easy

**What is given/known?**

Fractions and Drawings

**What is the unknown?**

Matching of fractions with shaded part of the drawings.

**Reasoning:**

Matching can be easily done by comparing the fractions and shaded areas.

**Solution:**

i)

$2 \times \frac{1}{5}$  matches with (d) since two circles are divided in to five parts and one part of both the circles is shaded.

$$2 \times \frac{1}{5} = \frac{1}{5} + \frac{1}{5}$$

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

ii)

$2 \times \frac{1}{2}$  matches with (b) as one half of both the drawings is shaded.

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

$$= \frac{2}{2}$$

$$= 1$$

iii)  $3 \times \frac{2}{3}$  matches with (a) since two third of the three circles is shaded.

$$\begin{aligned} 3 \times \frac{2}{3} &= \frac{2}{3} + \frac{2}{3} + \frac{2}{3} \\ &= 3 \times \frac{2}{3} \\ &= 2 \end{aligned}$$

iv)

$3 \times \frac{1}{4}$  matches with (c) since one fourth of three squares is shaded.

$$\begin{aligned} 3 \times \frac{1}{4} &= \frac{1}{4} + \frac{1}{4} + \frac{1}{4} \\ &= \frac{3}{4} \end{aligned}$$

**Q2.** Some pictures (a) to (c) are given below. Tell which of them show:

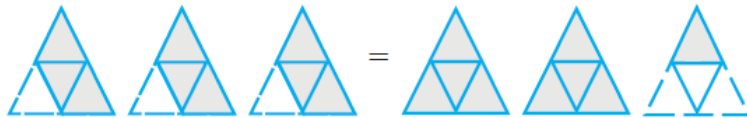
(i)  $3 \times \frac{1}{5} = \frac{3}{5}$

(ii)  $2 \times \frac{1}{3} = \frac{2}{3}$

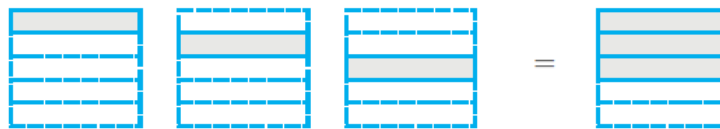
(iii)  $3 \times \frac{3}{4} = 2\frac{1}{4}$



(a)



(b)



(c)

**Difficulty Level: Easy**

**What is given/known?**

Fractions and pictures.

**What is the unknown?**

Matching of fractions with shaded part of the picture.

**Reasoning:**

Matching can be done by comparing the fractions with the shaded areas of the pictures.

**Solution:**

(i)  $3 \times \frac{1}{5} = \frac{3}{5}$  matches with (c) since,  $3 \times \frac{1}{5} = \frac{1}{5} + \frac{1}{5} + \frac{1}{5} = \frac{3}{5}$

(ii)  $2 \times \frac{1}{3} = \frac{2}{3}$  matches with (a) Since  $2 \times \frac{1}{3} = \frac{1}{3} + \frac{1}{3} = \frac{2}{3}$

(iii)  $3 \times \frac{3}{4} = 2\frac{1}{4}$  matches with (b) Since,  $3 \times \frac{3}{4} = \frac{3}{4} + \frac{3}{4} + \frac{3}{4} = 2\frac{1}{4}$

**Q 3.** Multiply and reduce to lowest form and convert into a mixed fraction: -

(i)  $7 \times \frac{3}{5}$       (ii)  $4 \times \frac{1}{3}$       (iii)  $2 \times \frac{6}{7}$       (iv)  $5 \times \frac{2}{9}$       (v)  $4 \times \frac{2}{3}$   
 (vi)  $6 \times \frac{5}{2}$       (vii)  $11 \times \frac{4}{7}$       (viii)  $20 \times \frac{4}{5}$       (ix)  $13 \times \frac{1}{3}$       (x)  $15 \times \frac{3}{5}$

**Difficulty Level: Low**

**What is given/known?**

Fractions multiplied with some numbers.

**What is the unknown?**

Lowest form and mixed form of the fractions

**Reasoning:**

Multiply the numerator with the given number to get improper fractions, Then convert the improper fractions in to mixed fractions.

**Solution:**

(i)

$$7 \times \frac{3}{5} = \frac{7 \times 3}{5} = \frac{21}{5} \text{ (improper fraction as numerator is greater than the denominator)}$$

Converting improper fraction into mixed fraction, we get

$$\frac{21}{5} = 4\frac{1}{5}$$

(ii)

$$4 \times \frac{1}{3} = \frac{4}{3} \text{ (improper fraction)}$$

Converting  $\frac{4}{3}$  into mixed fraction, we get

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

(iii)

$$2 \times \frac{6}{7} = \frac{2 \times 6}{7} = \frac{12}{7} \text{ (improper fraction)}$$

Converting  $\frac{12}{7}$  into mixed fraction, we get

$$\frac{12}{7} = 1\frac{5}{7}$$

$$5 \times \frac{2}{9} = \frac{5 \times 2}{9} = \frac{10}{9} \text{ (improper fraction)}$$

Converting  $\frac{10}{9}$  into mixed fraction, we get

$$\frac{10}{9} = 1\frac{1}{9}$$

(v)

$$4 \times \frac{2}{3} = \frac{4 \times 2}{3} = \frac{8}{3} \text{ (improper fraction)}$$

Converting  $\frac{8}{3}$  into mixed fraction, we get

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

(vi)

$$6 \times \frac{5}{2} = \frac{6 \times 5}{2} = \frac{30}{2} \text{ (improper fraction)}$$

Reducing  $\frac{30}{2}$  to the simplest form, we get

$$\frac{30}{2} = 15 \text{ (whole number)}$$

(vii)

$$11 \times \frac{4}{7} = \frac{11 \times 4}{7} = \frac{44}{7} \text{ (improper fraction)}$$

Converting  $\frac{44}{7}$  into mixed fraction, we get

$$\frac{44}{7} = 6\frac{2}{7}$$

(viii)

$$20 \times \frac{4}{5} = \frac{20 \times 4}{5} = \frac{80}{5} \text{ (improper fraction)}$$

Reducing  $\frac{80}{5}$  to the lowest form, we get

$$\frac{80}{5} = 16$$

(ix)

$$13 \times \frac{1}{3} = \frac{13 \times 1}{3} = \frac{13}{3} \text{ (improper fraction)}$$

Converting  $\frac{13}{3}$  into mixed fraction, we get

$$\frac{13}{3} = 4\frac{1}{3}$$

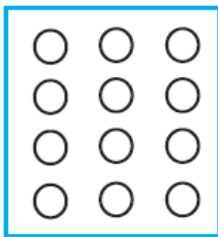
$$15 \times \frac{3}{5} = \frac{15 \times 3}{5} = \frac{45}{5} \text{ (improper fraction)}$$

Reducing  $\frac{45}{5}$  to the lowest form, we get

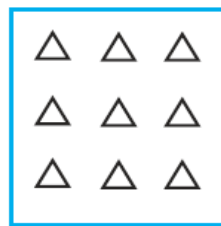
$$\frac{45}{5} = 9$$

**Q4.** Shade: (i)  $\frac{1}{2}$  of the circles in box (a) (ii)  $\frac{2}{3}$  of the triangles in box (b)

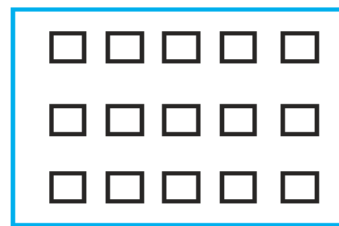
(iii)  $\frac{3}{5}$  of the squares in box (c)



(a)



(b)



(c)

**Difficulty Level: Low**

**What is known:**

Fraction of the figure to be shaded and unshaded figure.

**What is unknown:**

Shaded figure according to given fraction.

**Reasoning:**

First multiple the fraction by number of parts of given figure that's how we will get what number of parts need to be shade.

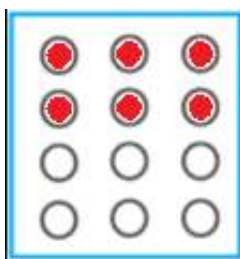
**Solution:**

(i)

Total number of circles in box (a) = 12

$$\frac{1}{2} \text{ of } 12 \text{ circles} = \frac{1}{2} \times 12 = 6 \text{ circles}$$

So, six circles should be shaded



Total number of triangles in box (b) = 9

$$\frac{2}{3} \text{ of 9 triangles} = \frac{2}{3} \times 9 = 6 \text{ triangles}$$

So, 6 triangles should be shaded.

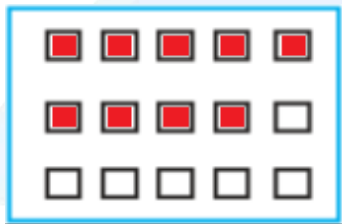


iii)

Total number of squares in box (c) = 15

$$\frac{3}{5} \text{ of 15 squares} = \frac{3}{5} \times 15 = 3 \times 3 = 9 \text{ squares}$$

So, nine squares should be shaded



**Q5. Find: -**

(a)  $\frac{1}{2}$  of i) 24 ii) 46

(b)  $\frac{2}{3}$  of i) 18 ii) 27

(c)  $\frac{3}{4}$  of i) 16 ii) 36

(d)  $\frac{4}{5}$  of i) 20 ii) 35

**Difficulty Level: Low**

**What is known:**

Fraction and whole.

**What is unknown:**

Part of following whole according to given fraction.

**Reasoning:**

Multiple whole by fraction.



(a) (i)  $\frac{1}{2}$  of 24 =  $\frac{1}{2} \times \frac{24}{1} = \frac{24}{2} = 12$

(ii)  $\frac{1}{2}$  of 46 =  $\frac{1}{2} \times \frac{46}{1} = \frac{46}{2} = 23$

(b) (i)  $\frac{2}{3}$  of 18 =  $\frac{2}{3} \times \frac{18}{1} = 2 \times 6 = 12$

(ii)  $\frac{2}{3}$  of 27 =  $\frac{2}{3} \times \frac{27}{1} = 2 \times 9 = 18$

(c) (i)  $\frac{3}{4}$  of 16 =  $\frac{3}{4} \times \frac{16}{1} = 3 \times 4 = 12$

(ii)  $\frac{3}{4}$  of 36 =  $\frac{3}{4} \times \frac{36}{1} = 3 \times 9 = 27$

(d) (i)  $\frac{4}{5}$  of 20 =  $\frac{4}{5} \times \frac{20}{1} = 4 \times 4 = 16$

(ii)  $\frac{4}{5}$  of 35 =  $\frac{4}{5} \times \frac{35}{1} = 4 \times 7 = 28$

**Q6.** Multiply and express as a mixed fraction:

(a)  $3 \times 5\frac{1}{5}$       (b)  $5 \times 6\frac{3}{4}$       (c)  $7 \times 2\frac{1}{4}$

(d)  $4 \times 6\frac{1}{3}$       (e)  $3\frac{1}{4} \times 6$       (f)  $3\frac{2}{5} \times 8$

**Difficulty Level:** Low

**What is known:**

Expression

**What is unknown:**

Product of given expression in mixed fraction

**Reasoning:**

Convert mixed fraction into improper fraction then find the product and convert the answer into mixed fraction

(a)

$$3 \times 5 \frac{1}{5} = \frac{3}{1} \times \frac{26}{5} = \frac{3 \times 26}{5} = \frac{78}{5} \text{ ( improper fraction )}$$

Converting  $\frac{78}{5}$  into mixed fraction, we get

$$\frac{78}{5} = 15 \frac{3}{5}$$

(b)

$$5 \times 6 \frac{3}{4} = \frac{5}{1} \times \frac{27}{4} = \frac{5 \times 27}{4} = \frac{135}{4} \text{ ( improper fraction )}$$

Converting  $\frac{135}{4}$  into mixed fraction, we get

$$\frac{135}{4} = 33 \frac{3}{4}$$

(c)

$$7 \times 2 \frac{1}{4} = \frac{7}{1} \times \frac{9}{4} = \frac{7 \times 9}{4} = \frac{63}{4} \text{ ( improper fraction )}$$

Converting  $\frac{63}{4}$  into mixed fraction, we get

$$\frac{63}{4} = 15 \frac{3}{4}$$

(d)

$$4 \times 6 \frac{1}{3} = \frac{4}{1} \times \frac{19}{3} = \frac{4 \times 19}{3} = \frac{76}{3} \text{ ( improper fraction )}$$

Converting  $\frac{76}{3}$  into mixed fraction, we get

$$\frac{76}{3} = 25 \frac{1}{3}$$

(e)

$$3 \frac{1}{4} \times 6 = \frac{13}{4} \times \frac{6}{1} = \frac{13 \times 6}{4} = \frac{78}{4} \text{ ( improper fraction )}$$

Converting  $\frac{78}{4}$  into mixed fraction, we get

$$\frac{78}{4} = 19 \frac{1}{2}$$

$$3\frac{2}{5} \times 8 = \frac{17}{5} \times \frac{8}{1} = \frac{17 \times 8}{5} = \frac{136}{5} \quad (\text{improper fraction})$$

Converting  $\frac{136}{5}$  into mixed fraction, we get

$$\frac{136}{5} = 27\frac{1}{5}$$

**Q7.** Find      (a)  $\frac{1}{2}$  of (i)  $2\frac{3}{4}$  (ii)  $4\frac{2}{9}$                       (b)  $\frac{5}{8}$  of (i)  $3\frac{5}{6}$  (ii)  $9\frac{2}{3}$

**Difficulty Level: Low**

**What is known:**

Fractions

**What is unknown:**

Product of the given fractions.

**Reasoning:**

Covert mixed fraction into improper fraction then find the product.

**Solution:**

(a)

(i)  $\frac{1}{2}$  of  $2\frac{3}{4}$

$$\begin{aligned} \frac{1}{2} \text{ of } 2\frac{3}{4} &= \frac{1}{2} \times 2\frac{3}{4} \\ &= \frac{1}{2} \times \frac{11}{4} = \frac{11}{8} \quad (\text{improper fraction}) \end{aligned}$$

Converting  $\frac{11}{8}$  into mixed fraction, we get

$$\frac{11}{8} = 1\frac{3}{8}$$

(ii)  $\frac{1}{2}$  of  $4\frac{2}{9} = \frac{1}{2} \times \frac{38}{9}$

$$= \frac{19}{9} \quad (\text{improper fraction})$$

Converting  $\frac{19}{9}$  into mixed fraction, we get

$$\frac{19}{9} = 2\frac{1}{9}$$

$$\begin{aligned} \text{(i) } \frac{5}{8} \text{ of } 3\frac{5}{6} &= \frac{5}{8} \times \frac{23}{6} \\ &= \frac{115}{48} \quad (\text{improper fraction}) \end{aligned}$$

Converting  $\frac{115}{48}$  into mixed fraction, we get,

$$\frac{115}{48} = 2\frac{19}{48}$$

$$\begin{aligned} \text{(ii) } \frac{5}{8} \text{ of } 9\frac{2}{3} &= \frac{5}{8} \times \frac{29}{3} \\ &= \frac{145}{24} \quad (\text{improper fraction}) \end{aligned}$$

Converting  $\frac{145}{24}$  into mixed fraction, we get,

$$\frac{145}{24} = 6\frac{1}{24}$$

**Q8.** Vidya and Pratap went for a picnic. Their mother gave them a water bottle that contained 5 liters of water. Vidya consumed  $\frac{2}{5}$  of the water. Pratap consumed the remaining water.

- i) How much water did Vidya drink?
- ii) What fraction of the total quantity of water did Pratap drink?

**Difficulty Level: Low**

**What is known:**

Total quantity of water and fraction of water consumed by Vidya.

**What is unknown:**

How much water did Vidya drink and what fraction of the total quantity of water did Pratap drink?

**Reasoning:**

Simply multiple the total quantity of water with fraction of water consumed by Vidya to find out how much she consumed. Subtract the fraction of water consumed by Vidya from total to get what fraction of water Pratap drink.

Total quantity of water in a bottle = 5 liters

(i)

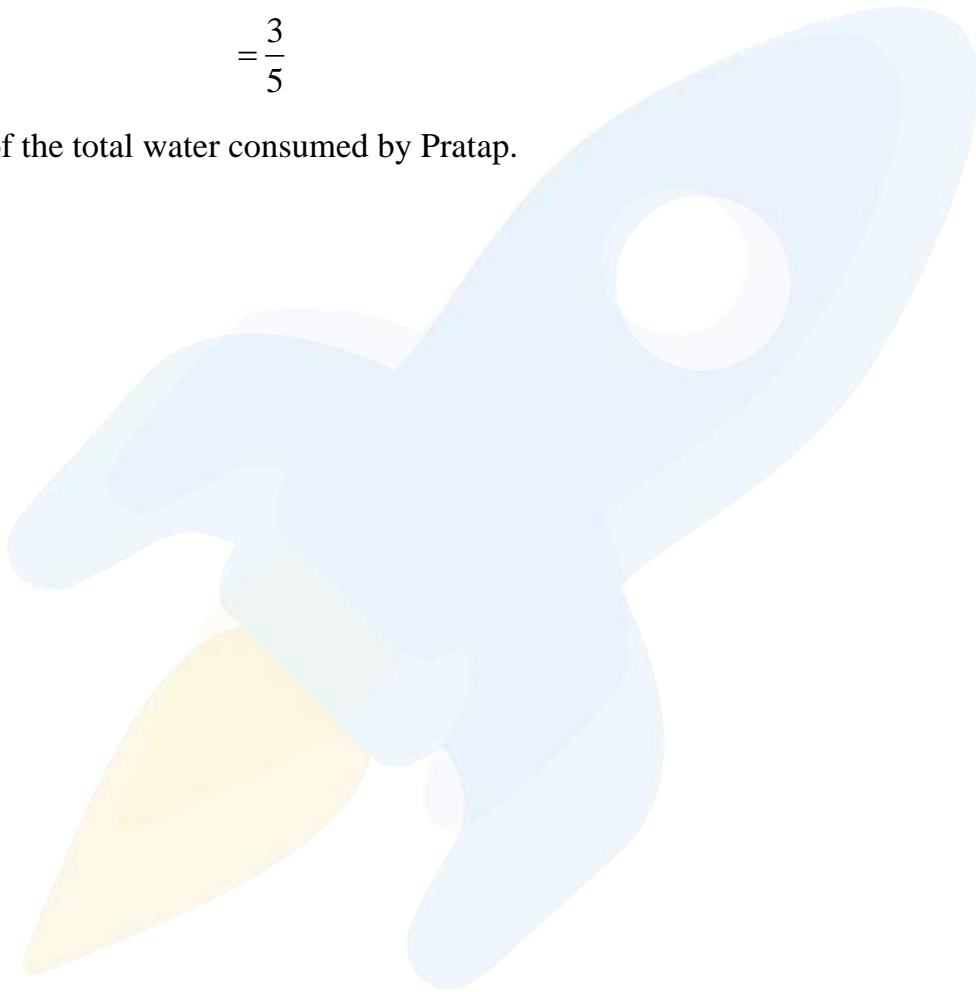
$$\begin{aligned}\text{Water consumed by Vidya} &= \frac{2}{5} \text{ of total water} \\ &= \frac{2}{5} \times 5 \\ &= 2\end{aligned}$$

Thus, Vidya consumed 2 liters of water.

(ii)

$$\begin{aligned}\text{Water consumed by Pratap} &= 1 - \frac{2}{5} \text{ of the total water} \\ &= \frac{3}{5}\end{aligned}$$

Thus,  $\frac{3}{5}$  of the total water consumed by Pratap.



## Chapter-2: Fractions and Decimals

### Exercise 2.3 (Page 41)

**Q1.** Find:

(i)  $\frac{1}{4}$  of (a)  $\frac{1}{4}$  (b)  $\frac{3}{5}$  (c)  $\frac{4}{3}$

(ii)  $\frac{1}{7}$  of (a)  $\frac{2}{9}$  (b)  $\frac{6}{5}$  (c)  $\frac{3}{10}$

**Difficulty Level: Low**

**What is known:**

Fractions

**What is unknown:**

Product of the given fractions.

**Reasoning:**

Find the product by multiplying numerator with numerator and denominator with denominator.

**Solution:**

(i)

(a)  $\frac{1}{4}$  of  $\frac{1}{4} = \frac{1}{4} \times \frac{1}{4} = \frac{1}{16}$

(b)  $\frac{1}{4}$  of  $\frac{3}{5} = \frac{1}{4} \times \frac{3}{5} = \frac{3}{20}$

(c)  $\frac{1}{4}$  of  $\frac{4}{3} = \frac{1}{4} \times \frac{4}{3} = \frac{4}{12} = \frac{1}{3}$

(ii)

(a)  $\frac{1}{7}$  of  $\frac{2}{9} = \frac{1}{7} \times \frac{2}{9} = \frac{1 \times 2}{7 \times 9} = \frac{2}{63}$

(b)  $\frac{1}{7}$  of  $\frac{6}{5} = \frac{1}{7} \times \frac{6}{5} = \frac{1 \times 6}{7 \times 5} = \frac{6}{35}$

(c)  $\frac{1}{7}$  of  $\frac{3}{10} = \frac{1}{7} \times \frac{3}{5} = \frac{1 \times 3}{7 \times 10} = \frac{3}{70}$

**Q2.** Multiply and reduce to lowest form (if possible):

(i)  $\frac{2}{3} \times 2\frac{2}{3}$

(ii)  $\frac{2}{7} \times \frac{7}{9}$

(iii)  $\frac{3}{8} \times \frac{6}{4}$

(iv)  $\frac{9}{5} \times \frac{3}{5}$

(v)  $\frac{1}{3} \times \frac{15}{8}$

(vi)  $\frac{11}{2} \times \frac{3}{10}$

(vii)  $\frac{4}{5} \times \frac{12}{7}$

**Difficulty Level: Medium**

**What is known:**

Expression

**What is unknown:**

Product of the given expression.

**Reasoning:**

Find the product by multiplying numerator with numerator and denominator with denominator.

**Solution:**

(i)

$$\begin{aligned} \frac{2}{3} \times 2\frac{2}{3} &= \frac{2}{3} \times \frac{8}{3} \\ &= \frac{2 \times 8}{3 \times 3} \\ &= \frac{16}{9} \quad (\text{improper fraction}) \end{aligned}$$

Converting  $\frac{16}{9}$  into mixed fraction, we get  $= 1\frac{7}{9}$

(ii)

$$\begin{aligned} \frac{2}{7} \times \frac{7}{9} &= \frac{2 \times 7}{7 \times 9} \\ &= \frac{14}{63} \end{aligned}$$

Reducing  $\frac{14}{63}$  to the lowest form, we get  $= \frac{2}{9}$

(iii)

$$\begin{aligned} \frac{3}{8} \times \frac{6}{4} &= \frac{3 \times 6}{8 \times 4} \\ &= \frac{18}{32} \end{aligned}$$

Reducing  $\frac{18}{32}$  to the lowest form, we get  $= \frac{9}{16}$

$$\frac{9}{5} \times \frac{3}{5} = \frac{9 \times 3}{5 \times 5}$$

$$= \frac{27}{25} \quad (\text{improper fraction})$$

Converting  $\frac{27}{25}$  into mixed fraction, we get  $= 1\frac{2}{25}$

(v)

$$\frac{1}{3} \times \frac{15}{8} = \frac{1 \times 15}{3 \times 8}$$

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

Reducing  $\frac{15}{24}$  to the lowest form, we get  $= \frac{5}{8}$

(vi)

$$\frac{11}{2} \times \frac{3}{10} = \frac{11 \times 3}{2 \times 10}$$

$$= \frac{33}{20} \quad (\text{improper fraction})$$

Converting  $\frac{33}{20}$  into mixed fraction, we get  $= 1\frac{13}{20}$

(vii)

$$\frac{4}{5} \times \frac{12}{7} = \frac{4 \times 12}{5 \times 7}$$

$$= \frac{48}{35} \quad (\text{improper fraction})$$

Converting  $\frac{48}{35}$  into mixed fraction, we get  $= 1\frac{13}{35}$

**Q3.** Multiply the following fractions:

i)  $\frac{2}{5} \times 5\frac{1}{4}$

ii)  $6\frac{2}{5} \times \frac{7}{9}$

iii)  $\frac{3}{2} \times 5\frac{1}{3}$

iv)  $\frac{5}{6} \times 2\frac{3}{7}$

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

vi)  $2\frac{3}{5} \times 3$

vii)  $3\frac{4}{7} \times \frac{3}{5}$

**Difficulty Level: Low**



Expression

**What is unknown:**

Product of the given expression.

**Reasoning:**

Covert mixed fraction into improper fraction then find the product.

**Solution:**

(i)

$$\frac{2}{5} \times 5\frac{1}{4} = \frac{2}{5} \times \frac{21}{4}$$

Reducing to the lowest form, we get

$$\begin{aligned} \frac{2}{5} \times \frac{21}{4} &= \frac{1 \times 21}{5 \times 2} \\ &= \frac{21}{10} \quad (\text{improper fraction}) \end{aligned}$$

Converting into mixed fraction, we get  $= 2\frac{1}{10}$

(ii)

$$\begin{aligned} 6\frac{2}{5} \times \frac{7}{9} &= \frac{32}{5} \times \frac{7}{9} \\ &= \frac{224}{45} \quad (\text{improper fraction}) \end{aligned}$$

Converting  $\frac{224}{45}$  into mixed fraction, we get  $= 4\frac{44}{45}$

(iii)

$$\begin{aligned} \frac{3}{2} \times 5\frac{1}{3} &= \frac{3}{2} \times \frac{16}{3} \\ &= \frac{3 \times 16}{2 \times 3} \end{aligned}$$

Reducing to the lowest form, we get  $= \frac{3 \times 16}{2 \times 3} = 8$  (This is a whole number)

$$\begin{aligned}\frac{5}{6} \times 2\frac{3}{7} &= \frac{5}{6} \times \frac{17}{7} \\ &= \frac{85}{42}\end{aligned}$$

Reducing  $\frac{85}{42}$  to the lowest form, we get  $= 2\frac{1}{42}$

(v)

$$\begin{aligned}3\frac{2}{5} \times \frac{4}{7} &= \frac{17}{5} \times \frac{4}{7} \\ &= \frac{68}{35} \quad (\text{improper fraction})\end{aligned}$$

Converting  $\frac{68}{35}$  into mixed fraction, we get  $= 1\frac{33}{35}$

(vi)

$$\begin{aligned}2\frac{3}{5} \times 3 &= \frac{13}{5} \times \frac{3}{1} \\ &= \frac{13 \times 3}{5 \times 1} \\ &= \frac{39}{5} \quad (\text{improper fraction})\end{aligned}$$

Converting  $\frac{39}{5}$  into mixed fraction, we get  $= 7\frac{4}{5}$

(vii)

$$\begin{aligned}3\frac{4}{7} \times \frac{3}{5} &= \frac{25}{7} \times \frac{3}{5} \\ &= \frac{25 \times 3}{7 \times 5} \\ &= \frac{75}{35}\end{aligned}$$

Reducing it to the lowest form, we get  $\frac{15}{7} =$  (improper fraction)

Converting  $\frac{15}{7}$  into mixed fraction, we get  $= 2\frac{1}{7}$

**Q4.** Which is greater?

(i)  $\frac{2}{7}$  of  $\frac{3}{4}$  or  $\frac{3}{5}$  of  $\frac{5}{8}$

(ii)  $\frac{1}{2}$  of  $\frac{6}{7}$  or  $\frac{2}{3}$  of  $\frac{3}{7}$

**Difficulty Level: Medium**

**What is known:**

Fractions.

**What is unknown:**

Which is greater.

**Reasoning:**

Convert the fractions into like fractions then compare by numerator.

**Solution:**

(i)

$$\frac{2}{7} \text{ of } \frac{3}{4} \text{ or } \frac{3}{5} \text{ of } \frac{5}{8}$$

$$\begin{aligned} \frac{2}{7} \text{ of } \frac{3}{4} &= \frac{2}{7} \times \frac{3}{4} \\ &= \frac{3}{14} \end{aligned}$$

$$\begin{aligned} \frac{3}{5} \text{ of } \frac{5}{8} &= \frac{3}{5} \times \frac{5}{8} \\ &= \frac{3}{8} \end{aligned}$$

Converting these fractions into like fraction, we get

$$\frac{3}{14} = \frac{3 \times 4}{14 \times 4} = \frac{12}{56}$$

$$\frac{3}{8} = \frac{3 \times 7}{8 \times 7} = \frac{21}{56}$$

Since,

$$\begin{aligned} \frac{21}{56} &> \frac{12}{56} \\ \frac{3}{8} &> \frac{3}{14} \end{aligned}$$

Thus  $\frac{3}{5}$  of  $\frac{5}{8}$  is greater.

$$\frac{1}{2} \text{ of } \frac{6}{7} \quad \text{or} \quad \frac{2}{3} \text{ of } \frac{3}{7}$$
$$\frac{1}{2} \text{ of } \frac{6}{7} = \frac{1}{2} \times \frac{6}{7}$$
$$= \frac{3}{7}$$
$$\frac{2}{3} \text{ of } \frac{3}{7} = \frac{2}{3} \times \frac{3}{7}$$
$$= \frac{2}{7}$$

On comparing, we get  $\frac{3}{7} > \frac{2}{7}$

Thus,  $\frac{1}{2}$  of  $\frac{6}{7}$  is greater.

**Q5.** Saili plants 4 saplings, in a row, in her garden. The distance between two adjacent saplings is  $\frac{3}{4}$  m. Find the distance between the first and the last sapling.

**Difficulty Level: Low**

**What is known:**

Number of saplings and distance between two adjacent saplings.

**What is unknown:**

Distance between the first and the last sapling.

**Reasoning:**

Add the distance of first to second, second to third and third to fourth. Since all the sapling are plant equidistance to each other then we can simply multiply  $\frac{3}{4}$  by 3.

**Solution:**

Total number of saplings = 4

Distance between two adjacent saplings =  $\frac{3}{4}$  m

Distance between the first and the last sapling =  $3 \times \frac{3}{4} = \frac{9}{4}$  m =  $2\frac{1}{4}$  m

Thus, the distance between the first and last sapling is  $2\frac{1}{4}$  m

**Q6.** Lipika reads a book for  $1\frac{3}{4}$  hour every day. She reads the entire book in 6 days. How many hours in all were required by her to read the book?

**Difficulty Level: Low**

**What is known:**

Lipika reads for  $1\frac{3}{4}$  hours every day and read the entire book in 6 days.

**What is unknown:**

Total hours required by her to complete the book.

**Reasoning:**

In a day she reads for  $1\frac{3}{4}$  hours so for calculating 6 days we can simply multiply  $1\frac{3}{4}$  hours by 6.

**Solution:**

No. of hours taken by Lipika to read a book everyday =  $1\frac{3}{4}$  hour =  $\frac{7}{4}$

No. of days taken to read the entire book = 6 days

Total no. of hours required by her to read the book =  $\frac{7}{4} \times 6 = \frac{42}{4}$  hours =  $10\frac{1}{2}$

Thus,  $10\frac{1}{2}$  hours in all were required by Lipika to read the book.

**Q7.** A car runs 16 km using 1 liter of petrol. How much distance will it cover using  $2\frac{3}{4}$  liters of petrol?

**Difficulty Level: Easy**

**What is known:**

A car runs 16 km using 1 liter of petrol.

**What is unknown:**

How much distance car can in  $2\frac{3}{4}$  liters of petrol?

**Reasoning:**

By using Unitary Method we can simply multiply  $2\frac{3}{4}$  by 16 to get how much distance will car cover in  $2\frac{3}{4}$  liters.

Distance covered by the car using 1 liter of petrol = 16 km

$$\begin{aligned} \text{Distance covered by using } \left(2\frac{3}{4} = \frac{11}{4} \text{ liter}\right) \text{ of petrol} &= \frac{16}{1} \times \frac{11}{4} \\ &= 44 \text{ km} \end{aligned}$$

Thus, 44 km distance covered by car using  $2\frac{3}{4}$  liters of petrol.

### Q 8.

a) i) Provide the number in the box  $\square$ , such that  $\frac{2}{3} \times \square = \frac{10}{30}$

ii) The simplest form of the number obtained in  $\square$  is —.

b) i) Provide the number in the box  $\square$ , such that  $\frac{3}{5} \times \square = \frac{24}{75}$

ii) The simplest form of the number obtained in  $\square$  is —.

a)

**Difficulty Level: Low**

**What is known:**

Equations.

**What is unknown:**

Value of the box.

**Reasoning:**

To make L.H.S. = R.H.S. we have to multiple numerator by 5 and denominator by 10.

**Solution:**

i)

$$\begin{aligned} \frac{2}{3} \times \square &= \frac{10}{30} \\ &= \frac{2}{3} \times \frac{5}{10} = \frac{10}{30} \end{aligned}$$

Therefore, the number in the box  $\square$ , such that  $\frac{2}{3} \times \square = \frac{10}{30}$  is  $\frac{5}{10}$ .

ii) The simplest form of the number obtained in  $\frac{5}{10}$  is  $\frac{1}{2}$ .

b)

**Difficulty Level: Low**

**What is known:**

Equations.

Value of the box.

**Reasoning:**

To make L.H.S. = R.H.S. we have to multiple numerator by 8 and denominator by 15.

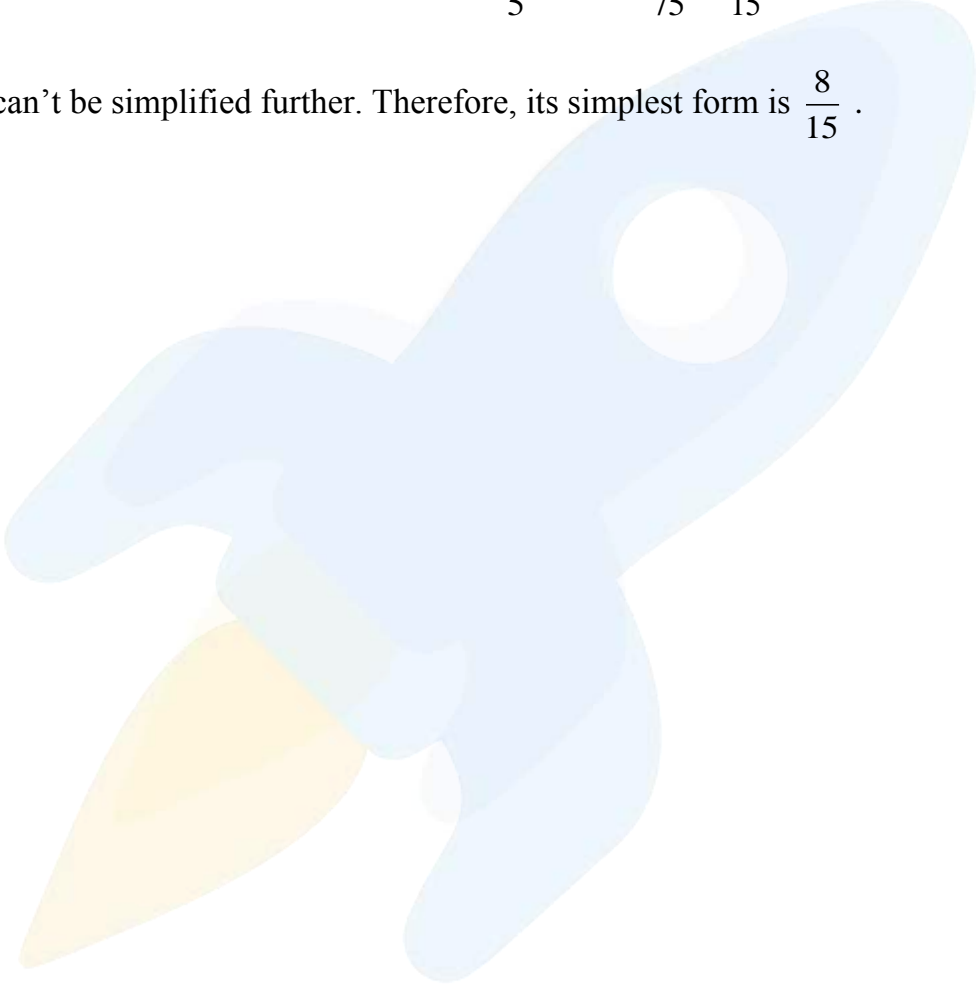
**Solution:**

i)

$$\begin{aligned}\frac{3}{5} \times \square &= \frac{24}{75} \\ &= \frac{3}{5} \times \frac{8}{15} = \frac{24}{75}\end{aligned}$$

Therefore, the number in the box  $\square$ , such that  $\frac{3}{5} \times \square = \frac{24}{75}$  is  $\frac{8}{15}$

ii) As  $\frac{8}{15}$  can't be simplified further. Therefore, its simplest form is  $\frac{8}{15}$ .



## Chapter-2: Fractions and Decimals

### Exercise 2.4 (Page 46)

**Q1. Find:**

(i)  $12 \div \frac{3}{4}$

(ii)  $14 \div \frac{5}{6}$

(iii)  $8 \div \frac{7}{3}$

(iv)  $4 \div \frac{8}{3}$

(v)  $3 \div 2\frac{1}{3}$

(vi)  $5 \div 3\frac{4}{7}$

**Difficulty Level: Easy**

**What is known:**

Expression.

**What is unknown:**

Value of the expression.

**Reasoning:**

To divide fractions, take the reciprocal of the divisor and multiply it with dividend.

**Solution:**

(i)  $12 \div \frac{3}{4}$   
 $= \frac{12}{1} \times \frac{4}{3}$   
 $= 4 \times 4$   
 $= 16$

(ii)  $14 \div \frac{5}{6}$   
 $= \frac{14}{1} \times \frac{6}{5}$   
 $= \frac{84}{5}$  (improper fraction)

Converting into mixed fraction, we get  $= 16\frac{4}{5}$



$$\begin{aligned} \text{(iii)} \quad & 8 \div \frac{3}{7} \\ & = \frac{8}{1} \times \frac{7}{3} \\ & = \frac{24}{7} \quad (\text{improper fraction}) \end{aligned}$$

Converting into mixed fraction, we get  $= 3\frac{3}{7}$

$$\begin{aligned} \text{(iv)} \quad & 4 \div \frac{8}{3} \\ & = \frac{4}{1} \times \frac{3}{8} \\ & = \frac{12}{8} \quad (\text{improper fraction}) \end{aligned}$$

Converting into mixed fraction, we get  $= 1\frac{1}{2}$

$$\begin{aligned} \text{(v)} \quad & 3 \div 2\frac{1}{3} \\ & = 3 \div \frac{7}{3} \\ & = \frac{3}{1} \times \frac{3}{7} \\ & = \frac{9}{7} \quad (\text{improper fraction}) \end{aligned}$$

Converting into mixed fraction, we get  $= 1\frac{2}{7}$

$$\begin{aligned} \text{(vi)} \quad & 5 \div 3\frac{4}{7} \\ & = 5 \div \frac{25}{7} \\ & = \frac{5}{1} \times \frac{7}{25} \\ & = \frac{7}{5} \quad (\text{improper fraction}) \end{aligned}$$

Converting into mixed fraction, we get  $= 1\frac{2}{5}$

**Q2.** Find the reciprocals of the following fractions. Classify the reciprocals as proper fractions, improper fractions, and whole numbers.

i)  $\frac{3}{7}$

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

iii)  $\frac{9}{7}$

iv)  $\frac{6}{5}$

v)  $\frac{12}{7}$

vi)  $\frac{1}{8}$

vii)  $\frac{1}{11}$

**Difficulty Level:** Easy

**What is known:**

Fractions.

**What is unknown:**

Reciprocal of given fraction.

**Reasoning:**

Reciprocal means interchanging numerator with denominator.

**Solution:**

(1) **Proper fraction:** - In proper fractions numerator is less than the denominator.

(2) **Improper fraction:** - In improper fractions numerator is greater than the denominator.

(3) **Whole number:** - It is a collection of positive integers including 0.

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

Reciprocal of  $\frac{3}{7}$  is  $\frac{7}{3}$  (Improper fraction)

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

Reciprocal of  $\frac{5}{8}$  is  $\frac{8}{5}$  (Improper fraction)

(iii)  $\frac{9}{7}$

Reciprocal of  $\frac{9}{7}$  is  $\frac{7}{9}$  (Proper fraction)

(iv)  $\frac{6}{5}$

Reciprocal of  $\frac{6}{5}$  is  $\frac{5}{6}$  (Proper fraction)

(v)  $\frac{12}{7}$

Reciprocal of  $\frac{12}{7}$  is  $\frac{7}{12}$  (Proper fraction)

(vi)  $\frac{1}{8}$

Reciprocal of  $\frac{1}{8}$  is  $\frac{8}{1} = 8$  (Whole number)

(vii)  $\frac{1}{11}$

Reciprocal of  $\frac{1}{11}$  is  $\frac{11}{1} = 11$  (Whole number)

**Q3. Find:**

(i)  $\frac{7}{3} \div 2$

(ii)  $\frac{4}{9} \div 5$

(iii)  $\frac{6}{13} \div 7$

(iv)  $4\frac{1}{3} \div 3$

(v)  $3\frac{1}{2} \div 4$

(vi)  $4\frac{3}{7} \div 7$

**Difficulty Level: Easy**

**What is known:**

Expression.

**What is unknown:**

Value of the expression.

**Reasoning:**

To divide fractions, take the reciprocal of the divisor and multiply it with dividend.

**Solution:**

(i)  $\frac{7}{3} \div 2$

$$= \frac{7}{3} \times \frac{1}{2}$$

$$= \frac{7}{6} \text{ (improper fraction)}$$

Converting into mixed fraction, we get  $= 1\frac{1}{6}$

$$\begin{aligned} \text{(ii)} \quad & \frac{4}{9} \div 5 \\ & = \frac{4}{9} \times \frac{1}{5} \\ & = \frac{4}{45} \end{aligned}$$

$$\begin{aligned} \text{(iii)} \quad & \frac{6}{13} \div 7 \\ & = \frac{6}{13} \times \frac{1}{7} \\ & = \frac{6}{91} \end{aligned}$$

$$\begin{aligned} \text{(iv)} \quad & 4\frac{1}{3} \div 3 \\ & = \frac{13}{3} \times \frac{1}{3} \\ & = \frac{13}{9} \quad \text{(Improper fraction)} \end{aligned}$$

Converting into mixed fraction, we get  $= 1\frac{4}{9}$

$$\begin{aligned} \text{(v)} \quad & 3\frac{1}{2} \div 4 \\ & = \frac{7}{2} \times \frac{1}{4} \\ & = \frac{7}{8} \end{aligned}$$

$$\begin{aligned} \text{(vi)} \quad & 4\frac{3}{7} \div 7 \\ & = 4\frac{3}{7} \times \frac{1}{7} \\ & = \frac{31}{7} \times \frac{1}{7} \\ & = \frac{31}{49} \end{aligned}$$

**Q4. Find:**

(i)  $\frac{2}{5} \div \frac{1}{2}$

(ii)  $\frac{4}{9} \div \frac{2}{3}$

(iii)  $\frac{3}{7} \div \frac{8}{7}$

(iv)  $2\frac{1}{3} \div \frac{3}{5}$

(v)  $3\frac{1}{2} \div \frac{8}{3}$

(vi)  $\frac{2}{5} \div 1\frac{1}{2}$

(vii)  $3\frac{1}{5} \div 1\frac{2}{3}$

(viii)  $2\frac{1}{5} \div 1\frac{1}{5}$

**Solution:**

$$\begin{aligned} \text{(i)} \quad & \frac{2}{5} \div \frac{1}{2} \\ &= \frac{2}{5} \times \frac{2}{1} \\ &= \frac{2 \times 2}{5 \times 1} \\ &= \frac{4}{5} \end{aligned}$$

$$\begin{aligned} \text{(ii)} \quad & \frac{4}{9} \div \frac{2}{3} \\ &= \frac{4}{9} \times \frac{3}{2} \\ &= \frac{4 \times 3}{9 \times 2} \\ &= \frac{2 \times 1}{3 \times 1} \\ &= \frac{2}{3} \end{aligned}$$

$$\begin{aligned} \text{(iii)} \quad & \frac{3}{7} \div \frac{8}{7} \\ &= \frac{3}{7} \times \frac{7}{8} \\ &= \frac{3 \times 7}{7 \times 8} \\ &= \frac{3}{8} \end{aligned}$$

$$\begin{aligned}
 \text{(iv)} \quad & 2\frac{1}{3} \div \frac{5}{3} \\
 &= 2\frac{1}{3} \times \frac{3}{5} \\
 &= \frac{7}{3} \times \frac{3}{5} \\
 &= \frac{7 \times 3}{3 \times 5} \\
 &= \frac{35}{9} \quad (\text{improper fraction})
 \end{aligned}$$

Converting  $\frac{35}{9}$  into mixed fraction, we get  $= 3\frac{8}{9}$

$$\begin{aligned}
 \text{(v)} \quad & 3\frac{1}{2} \div \frac{8}{3} \\
 &= 3\frac{1}{2} \times \frac{3}{8} \\
 &= \frac{7}{2} \times \frac{3}{8} \\
 &= \frac{7 \times 3}{2 \times 8} \\
 &= \frac{21}{16} \quad (\text{improper fraction})
 \end{aligned}$$

Converting  $\frac{21}{16}$  into mixed fraction, we get  $= 1\frac{5}{16}$

$$\begin{aligned}
 \text{(vi)} \quad & \frac{2}{5} \div 1\frac{1}{2} \\
 &= \frac{2}{5} \div \frac{3}{2} \\
 &= \frac{2}{5} \times \frac{2}{3} \\
 &= \frac{4}{15}
 \end{aligned}$$

$$\begin{aligned}
 \text{(vii)} \quad & 3\frac{1}{5} \div 1\frac{2}{3} \\
 &= \frac{16}{5} \div \frac{5}{3} \\
 &= \frac{16}{5} \times \frac{3}{5} \\
 &= \frac{48}{25} \quad (\text{improper fraction})
 \end{aligned}$$

Converting  $\frac{48}{25}$  into mixed fraction, we get  $= 1\frac{23}{25}$

$$(viii) \quad 2\frac{2}{5} \div 1\frac{1}{5}$$

$$= \frac{11}{5} \div \frac{6}{5}$$

$$= \frac{11}{5} \times \frac{5}{6}$$

$$= \frac{11}{6} \quad (\text{improper fraction})$$

Converting  $\frac{11}{6}$  into mixed fraction, we get  $= 1\frac{5}{6}$



## Chapter-2: Fractions and Decimals

### Exercise 2.5 (Page 47 of Grade 7 NCERT)

**Q1.** What is greater?

(i) 0.5 or 0.05

(ii) 0.7 or 0.5

(iii) 7 or 0.7

(iv) 1.37 or 1.49

(v) 2.03 or 2.30

(vi) 0.8 or 0.88

**Difficulty Level: Easy**

**What is known:**

Decimal numbers

**What is unknown:**

Which decimal number is greater?

**Reasoning:**

First convert these decimals into fractions then convert them into like fraction, now we can simply find out which fraction/decimal is greater.

**Solution:**

(i) 0.5 or 0.05

0.5            0.05

$\frac{5}{10}$              $\frac{5}{100}$

Converting them into like fractions, we get

$\frac{5 \times 10}{10 \times 10}$              $\frac{5 \times 1}{100 \times 1}$

$\frac{50}{100}$              $\frac{5}{100}$

$\frac{50}{100}$              $\frac{5}{100}$

Therefore,  $0.5 > 0.05$ .



ii) 0.7 or 0.5

$$0.7 \quad \square \quad 0.5$$

$$\frac{7}{10} \quad \square \quad \frac{5}{10}$$

$$\frac{7}{10} \quad \square > \quad \frac{5}{10}$$

 Therefore,  $0.7 > 0.5$ .

iii) 7 or 0.7

$$7 \quad \square \quad \frac{7}{10}$$

$$= \frac{7 \times 10}{1 \times 10} \quad \square \quad \frac{7}{10}$$

$$\frac{70}{10} \quad \square > \quad \frac{7}{10}$$

 Therefore,  $7 > 0.7$ .  
 Hence, 7 is greater.

iv) 1.37 or 1.49

$$= 1.37 \quad \square \quad 1.49$$

$$= \frac{137}{100} \quad \square \quad \frac{149}{100}$$

$$= \frac{137}{100} \quad \square < \quad \frac{149}{100}$$

 Therefore,  $1.37 < 1.49$   
 Hence, 1.49 is greater.

v) 2.03 or 2.30

$$2.03 \quad \square \quad 2.30$$

$$\frac{203}{100} \quad \square \quad \frac{230}{100}$$

$$\frac{203}{100} \quad \square < \quad \frac{230}{100}$$

Therefore,  $2.03 < 2.30$

Hence, 2.30 is greater.

vi) 0.8 or 0.88

$$\frac{08}{10} \quad \square \quad \frac{088}{100}$$

Converting them into like fractions, we get

$$\frac{8 \times 10}{10 \times 10} \quad \square \quad \frac{88}{100}$$
$$\frac{80}{100} \quad \square < \quad \frac{88}{100}$$

Therefore,  $0.8 < 0.88$ .

Hence, 0.88 is greater.

**Q2.** Express as rupees using decimals:

i) 7 paise

ii) 7 rupees 7 paise

iii) 77 rupees 77 paise

iv) 50 paise

v) 235 paise

**Difficulty Level: Easy**

**What is known:**

Amount in paise.

**What is unknown:**

Amount in rupees.

**Reasoning:**

$$1 \text{ paise} = \frac{1}{100} \text{ rupees}$$

**Solution:**

i) 7 paise

$$100 \text{ paise} = 1 \text{ rupees}$$

$$1 \text{ paise} = \frac{1}{100} \text{ rupees}$$

$$7 \text{ paise} = 7 \times \frac{1}{100} \text{ rupees}$$
$$= 0.07 \text{ rupees}$$

ii) 7 rupees 7 paise

$$100 \text{ paise} = 1 \text{ rupees}$$

$$1 \text{ paise} = \frac{1}{100} \text{ rupees}$$

$$\begin{aligned} 7 \text{ rupees } 7 \text{ paise} &= 7 \text{ rupees} + 7 \text{ paise} \\ &= 7 \text{ rupees} + 7 \times \frac{1}{100} \text{ rupees} \\ &= 7 \text{ rupees} + 0.07 \text{ rupees} \\ &= 7.07 \text{ rupees} \end{aligned}$$

iii) 77 rupees 77 paise

$$(100 \text{ paise} = 1 \text{ rupees})$$

$$(1 \text{ paise} = \frac{1}{100} \text{ rupees})$$

$$\begin{aligned} 77 \text{ rupees } 77 \text{ paise} &= 77 \text{ rupees} + 77 \text{ paise} \\ &= 77 \text{ rupees} + 77 \times \frac{1}{100} \text{ rupees} \\ &= 77 \text{ rupees} + 0.77 \text{ rupees} \\ &= 77.77 \text{ rupees} \end{aligned}$$

iv) 50 paise

$$(100 \text{ paise} = 1 \text{ rupees})$$

$$(1 \text{ paise} = \frac{1}{100} \text{ rupees})$$

$$100 \text{ paise} = 1 \text{ rupees}$$

$$1 \text{ paise} = \frac{1}{100} \text{ rupees}$$

$$50 \text{ paise} = 50 \times \frac{1}{100} \text{ rupees}$$

$$\Rightarrow 50 \text{ paise} = \frac{50}{100} \text{ rupees}$$

$$50 \text{ paise} = 0.50 \text{ rupees}$$

v) 235 paise

$$100 \text{ paise} = 1 \text{ rupees}$$

$$1 \text{ paise} = \frac{1}{100} \text{ rupees}$$

$$235 \text{ paise} = 235 \times \frac{1}{100} \text{ rupees}$$

$$235 \text{ paise} = \frac{235}{100} \text{ rupees}$$

$$235 \text{ paise} = 2.35 \text{ rupees}$$

**Q3.** i) Express 5 cm in meter and kilometer

ii) Express 35 mm in cm ,m and km.

**Difficulty Level: Moderate**

**What is known:**

Lengths in centimeter and millimeter

**What is unknown:**

Length in different units.

**Reasoning:**

$$1 \text{ cm} = \frac{1}{100} \text{ m}$$

$$1 \text{ m} = \frac{1}{1000} \text{ km}$$

$$1 \text{ mm} = \frac{1}{10} \text{ cm}$$

**Solution:**

(i) 5 cm

$$\because 100 \text{ cm} = 1 \text{ m}$$

$$\therefore 1 \text{ cm} = \frac{1}{100} \text{ m}$$

$$5 \text{ cm} = 5 \times \frac{1}{100} \text{ m}$$

$$5 \text{ cm} = 0.05 \text{ m}$$

Also,  $1000 \text{ m} = 1 \text{ km}$

$$\therefore 1 \text{ m} = \frac{1}{1000} \text{ km}$$

Thus,

$$0.05 \text{ m} = 0.05 \times \frac{1}{1000} \text{ km}$$

$$= \frac{0.05}{1000} \text{ km}$$

$$= 0.00005 \text{ km}$$

(ii) Express 35 mm in cm, m and km.

$$\because 10 \text{ mm} = 1 \text{ cm}$$

$$\therefore 1 \text{ mm} = \frac{1}{10} \text{ cm}$$



$$35\text{mm} = 35 \times \frac{1}{10} \text{cm}$$

$$35\text{mm} = \frac{35}{10} \text{cm}$$

$$35\text{mm} = 3.5\text{cm}$$

Now, converting 3.5 cm in m, we get

$$\because 100 \text{ cm} = 1 \text{ m}$$

$$\therefore 1 \text{ cm} = \frac{1}{100} \text{ m}$$

$$3.5 \text{ cm} = 3.5 \times \frac{1}{100} \text{ m}$$

$$3.5 \text{ cm} = \frac{3.5}{100} \text{ m}$$

$$3.5 \text{ cm} = 0.035 \text{ m}$$

Again, converting 0.035 m into km

$$\because 1000 \text{ m} = 1\text{km}$$

$$\therefore 1\text{m} = \frac{1}{1000} \text{ km}$$

$$0.035 \text{ m} = 0.035 \times \frac{1}{1000} \text{ km}$$

$$\times 0.035 \text{ m} = \frac{0.035}{1000} \text{ km}$$

$$0.035 \text{ m} = 0.000035 \text{ km}$$

**Q4.** Express in kg:

(i) 200 g

(ii) 3470 g

(iii) 4 kg 8 g

**Difficulty Level: Easy**

**What is known:**

Weight in grams

**What is unknown:**

Weight in kilograms.

**Reasoning:**

$$1 \text{ g} = \frac{1}{1000} \text{ kg}$$

**Solution:**

(i) 200 g

$$\because 1000\text{g} = 1 \text{ kg}$$

$$\therefore 1\text{g} = \frac{1}{1000} \text{ kg}$$

$$200 \text{ g} = 200 \times \frac{1}{1000} \text{ kg}$$

$$= \frac{200}{1000} \text{ kg}$$

$$= 0.200 \text{ kg}$$

Or

$$= \frac{200}{1000}$$

$$= \frac{2}{10} \text{ kg}$$

$$= 0.2 \text{ kg}$$

(ii) 3470 g

$$\because 1000 \text{ g} = 1 \text{ kg}$$

$$\therefore 1 \text{ g} = \frac{1}{1000} \text{ kg}$$

$$3470 \text{ g} = 3470 \times \frac{1}{1000} \text{ kg}$$

$$3470 \text{ g} = \frac{3470}{1000} \text{ kg}$$

$$3470 \text{ g} = \frac{347}{100}$$

$$3470 \text{ g} = 3.47 \text{ kg}$$

(iii) 4 kg 8 g

$$4 \text{ kg } 8 \text{ g} = 4 \text{ kg} + 8 \text{ g}$$

$$4 \text{ kg } 8 \text{ g} = 4 \text{ kg} + \frac{8}{1000} \text{ kg}$$

$$\because 1000 \text{ g} = 1 \text{ kg}$$

$$\therefore 1 \text{ g} = \frac{1}{1000} \text{ kg}$$

$$4 \text{ kg } 8 \text{ g} = 4 \text{ kg} + 0.008 \text{ kg}$$

$$4 \text{ kg } 8 \text{ g} = 4.008 \text{ kg}$$

**Q5.** Write the following decimal numbers in expanded form:-

i) 20.03

ii) 2.03

iii) 200.03

iv) 2.034

**Difficulty Level: Easy**

**What is known:**

Decimal numbers

Decimal numbers in expanded form.

**Reasoning:**

Hundreds	Tens	Ones	Decimal	Tenths	Hundredths
100	10	1	.	$\frac{1}{10}$	$\frac{1}{100}$

**Solution:**

i) 20.03

$$20.03 = 2 \times 10 + 0 \times 1 + 0 \times \frac{1}{10} + 3 \times \frac{1}{100}$$

ii) 2.03

$$2.03 = 2 \times 1 + 0 \times \frac{1}{10} + 3 \times \frac{1}{100}$$

iii) 200.03

$$200.03 = 2 \times 100 + 0 \times 10 + 0 \times 1 + 0 \times \frac{1}{10} + 3 \times \frac{1}{100}$$

iv) 2.034

$$2.034 = 2 \times 1 + 0 \times \frac{1}{10} + 3 \times \frac{1}{100} + 4 \times \frac{1}{1000}$$

**Q6.** Write the place value of 2 in the following decimal numbers:-

i) 2.56

ii) 21.37

iii) 10.25

iv) 9.42

v) 63.352

**Difficulty Level: Easy**

**What is known:**

Decimal numbers

**What is unknown:**

Place value of 2.

**Reasoning:**

Hundreds	Tens	Ones	Decimal	Tenths	Hundredths
100	10	1	.	$\frac{1}{10}$	$\frac{1}{100}$

i) 2.56

2.56

2 is at ones place.

ii) 21.37

21.37

2 is at tens place.

iii) 10.25

10.25

2 is at tenths place.

iv) 9.42

9.42

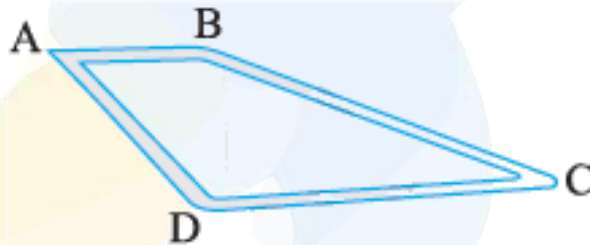
2 is at hundredth place.

v) 63.352

63.352

2 is at thousandths place.

**Q7.** Dinesh went from place A to place B and from there to place C. A is 7.5 km from B. And B is 12.7 km from C. Ayub went from place A to place D and from there to place C. D is 9.3 km from A and C is 11.8 km from D .  
Who travelled more and how much ?



**Difficulty Level: Moderate**

**What is known:**

Distance between points. Dinesh went from place A to B and then B to C. Ayub went from place A to D then D to C.

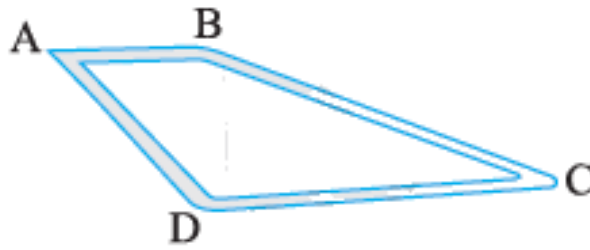
**What is unknown:**

Who travelled more and how much?

**Reasoning:**

Calculate by all the distance travelled by Dinesh to how much he travelled then calculate distance travel by Ayub.





Given:

Distance travelled by Dinesh from A to B = 7.5 km

And from place B to place C = 12.7 km

$$\begin{aligned}\therefore \text{Total distance travelled by Dinesh} &= AB + BC \\ &= 7.5 \text{ km} + 12.7 \text{ km} \\ &= 20.2 \text{ km}\end{aligned}$$

Distance travelled by Ayub from place A to place D = 9.3 km

And from place D to place C = 11.8 km

$$\begin{aligned}\therefore \text{Total distance travelled by Ayub} &= 9.3 \text{ km} + 11.8 \text{ km} \\ &= 21.1 \text{ km}\end{aligned}$$

On comparing the total distance travelled by Dinesh and Ayub, we get  
 $21.1 \text{ km} > 20.2 \text{ km}$

Distance travelled by Ayub > Distance travelled by Dinesh

$$\begin{aligned}\therefore \text{Ayub covered more distance by Dinesh is} &= 21.1 - 20.2 \\ &= 0.9 \text{ km} \\ &= 0.9 \times 1000 \text{ m} \\ &= 900 \text{ m}\end{aligned}$$

**Q8.** Shyama bought 5 kg 300 g. apples and 3 kg 250 g mangoes. Sarala bought 4kg 800 g oranges and 4 kg 150 g bananas. Who bought more fruits?

**Difficulty Level:** Easy

**What is known:**

Fruits bought by Shyama and Sarala.

**What is unknown:**

Who bought more fruits?

**Reasoning:**

Find out total fruits purchased by both Shyama and Sarala then we easily find out who bought more.

**Solution:**

Weight of apples bought by Shyama = 5 kg 300 g

Weight of mangoes bought by Shyama = 3 kg 250 g

$$\begin{aligned}\therefore \text{Total weight of fruits bought by Shyama} &= 5 \text{ kg } 300 \text{ g} + 3 \text{ kg } 250 \text{ g} \\ &= 8 \text{ kg } 550 \text{ g}\end{aligned}$$

Also,

Weight of oranges bought by Sarala = 4 kg 800 g

Weight of oranges bought by Sarala = 4 kg 150 g

Total weight of fruits bought by Sarala = 4 kg 800 g + 4 kg 150 g  
= 8kg 950g

On comparing the quantity of fruits, we get

$8\text{kg } 950\text{g} > 8\text{ kg } 550\text{ g}$

Thus, Sarala bought more fruits.

**Q9.** How much less is 28 km than 42.6 km?

**Difficulty Level:** Easy

**What is known:**

Two numbers.

**What is unknown:**

Difference between these two numbers.

**Reasoning:**

We can simply calculate it by subtracting smaller number from bigger number.

**Solution:**

Here,

We have to find out the difference between 28 km and 42.6 km

$$\begin{aligned}\therefore \text{Difference} &= 42.6 - 28 \\ &= 14.6 \text{ km}\end{aligned}$$

Thus, 14.6 km less is 28 km than 42.6 km.

## Chapter-2: Fractions and Decimals

### Exercise 2.6 (Page 52 of Grade 7 NCERT)

**Q1.** Find

i)  $0.2 \times 6$

ii)  $8 \times 4.6$

iii)  $2.71 \times 5$

iv)  $20.1 \times 4$

v)  $0.05 \times 7$

vi)  $211.02 \times 4$

vii)  $2 \times 0.86$

**Difficulty Level: Easy**

**What is known:**

One decimal number and one whole number.

**What is unknown:**

Product of these two numbers.

**Reasoning:**

Covert decimal number into fraction and then find the product.

**Solution:**

(i)

$$0.2 \times 6 = \frac{2}{10} \times 6$$

$$0.2 \times 6 = \frac{2 \times 6}{10}$$

$$0.2 \times 6 = \frac{12}{10}$$

$$0.2 \times 6 = 1.2$$

(ii)

$$8 \times 4.6 = 8 \times \frac{46}{10}$$

$$8 \times 4.6 = \frac{8 \times 46}{10}$$

$$8 \times 4.6 = \frac{368}{10}$$

$$8 \times 4.6 = 3.68$$

(iii)

$$2.71 \times 5 = \frac{271}{100} \times 5$$

$$2.71 \times 5 = \frac{271 \times 5}{100}$$

$$2.71 \times 5 = \frac{1355}{100}$$

$$2.71 \times 5 = 13.55$$

(iv)

$$20.1 \times 4 = \frac{201}{10} \times 4$$

$$20.1 \times 4 = \frac{201 \times 4}{10}$$

$$20.1 \times 4 = \frac{804}{10}$$

$$20.1 \times 4 = 80.4$$

(v)

$$0.05 \times 7 = \frac{5}{100} \times \frac{7}{1}$$

$$0.05 \times 7 = \frac{5 \times 7}{100}$$

$$0.05 \times 7 = \frac{35}{100}$$

$$0.05 \times 7 = 0.35$$

(vi)

$$211.02 \times 4 = \frac{21102}{100} \times \frac{4}{1}$$

$$211.02 \times 4 = \frac{21102 \times 4}{100}$$

$$211.02 \times 4 = \frac{84408}{100}$$

$$211.02 \times 4 = 844.08$$

$$2 \times 0.86 = \frac{2}{1} \times \frac{86}{100}$$

$$2 \times 0.86 = \frac{2 \times 86}{100}$$

$$2 \times 0.86 = \frac{172}{100}$$

$$2 \times 0.86 = 1.72$$

Q2. Find the area of rectangle whose length is 5.7 cm and breadth is 3 cm.

**Difficulty Level: Easy**

**What is known:**

Dimensions of rectangle.

**What is unknown:**

Area of rectangle.

**Reasoning:**

Area of rectangle = Length  $\times$  Breadth

**Solution:**

**Given:**

Length of rectangle = 5.7 cm

Breadth of rectangle = 3 cm

$$\begin{aligned} \therefore \text{Area of rectangle} &= \text{Length} \times \text{Breadth} \\ &= 5.7 \times 3 \\ &= 17.1 \end{aligned}$$

Thus, the area of rectangle is 17.1 cm

**Q3. Find:**

i)  $1.3 \times 10$

ii)  $36.8 \times 10$

iii)  $153.7 \times 10$

iv)  $168.07 \times 10$

v)  $31.1 \times 100$

vi)  $156.1 \times 100$

vii)  $3.62 \times 100$

viii)  $43.07 \times 100$

ix)  $0.5 \times 10$

x)  $0.08 \times 10$

xi)  $0.9 \times 100$

xii)  $0.03 \times 1000$

**Difficulty Level: Easy**

**What is known:**

One decimal number and one whole number.

**What is unknown:**

Product of these numbers.

We know that when a number is multiplied by 10, 100 or 1000 the digits in the products are same as in the decimal number but, the decimal point in the product is shifted to the right by as many places as there are zeros.

**Solution:**

i)  $1.3 \times 10 = 13.0$

ii)  $36.8 \times 10 = 368.0$

iii)  $153.7 \times 10 = 1537.0$

iv)  $168.07 \times 10 = 1680.7$

v)  $31.1 \times 100 = 3110.0$

vi)  $156.1 \times 100 = 15610.0$

vii)  $3.62 \times 100 = 362.0$

viii)  $43.07 \times 100 = 4307.0$

ix)  $0.5 \times 10 = 5.0$

x)  $0.08 \times 10 = 0.8$

xi)  $0.9 \times 100 = 90.0$

xii)  $0.03 \times 1000 = 30.0$

**Q4.** A two-wheeler covers a distance of 55.3 km in 1 liter of petrol. How much it will cover in 10 liters of petrol?

**Difficulty Level: Easy**

**What is known:**

A two-wheeler covers a distance of 55.3 km in 1 liter of petrol.

**What is unknown:**

How much it will cover in 10 liters of petrol.

**Reasoning:**

By using Unitary Method, we can simply multiply 55.3 by 10 to get answer.

**Solution:**

Distance covered by two-wheeler in 1 liter of petrol = 55.3 km

Distance covered by 10 liters of petrol =  $55.3 \times 10 = 553.0$  km

Therefore, it will cover a distance of 553 km in 10 liter of petrol.

**Q5. Find:**

i)  $2.5 \times 0.3$

ii)  $0.1 \times 51.7$

iii)  $0.2 \times 316.8$

iv)  $1.3 \times 3.1$

v)  $0.5 \times 0.05$

vi)  $11.2 \times 0.15$

vii)  $1.07 \times 0.02$

viii)  $10.05 \times 1.05$

ix)  $101.01 \times 0.01$

x)  $100.01 \times 1.1$

**Difficulty Level: Moderate****What is known:**

Decimal numbers.

**What is unknown:**

Product of these two numbers.

**Reasoning:**

Covert decimal number into fraction and then find the product.

**Solution:**

(i)

$$\begin{aligned} 2.5 \times 0.3 &= \frac{25}{10} \times \frac{3}{10} \\ &= \frac{25 \times 3}{100} \\ &= \frac{75}{100} \\ &= 0.75 \end{aligned}$$

(ii)

$$\begin{aligned} 0.1 \times 51.7 &= \frac{1}{10} \times \frac{517}{10} \\ &= \frac{1 \times 517}{100} \\ &= \frac{517}{100} \\ &= 5.17 \end{aligned}$$

(iii)

$$\begin{aligned} 0.2 \times 316.8 &= \frac{2}{10} \times \frac{3168}{10} \\ &= \frac{2 \times 3168}{100} \\ &= \frac{6336}{100} \\ &= 63.36 \end{aligned}$$

$$\begin{aligned} 1.3 \times 3.1 &= \frac{13}{10} \times \frac{31}{10} \\ &= \frac{13 \times 31}{100} \\ &= \frac{403}{100} \\ &= 4.03 \end{aligned}$$

(v)

$$\begin{aligned} 0.5 \times 0.05 &= \frac{5}{10} \times \frac{5}{100} \\ &= \frac{5 \times 5}{1000} \\ &= \frac{25}{1000} \\ &= 0.025 \end{aligned}$$

(vi)

$$\begin{aligned} 11.2 \times 0.15 &= \frac{112}{10} \times \frac{15}{100} \\ &= \frac{112 \times 15}{1000} \\ &= \frac{1680}{1000} \\ &= 1.68 \end{aligned}$$

(vii)

$$\begin{aligned} 1.07 \times 0.02 &= \frac{107}{100} \times \frac{2}{100} \\ &= \frac{107 \times 2}{10000} \\ &= \frac{214}{10000} \\ &= 0.0214 \end{aligned}$$

(viii)

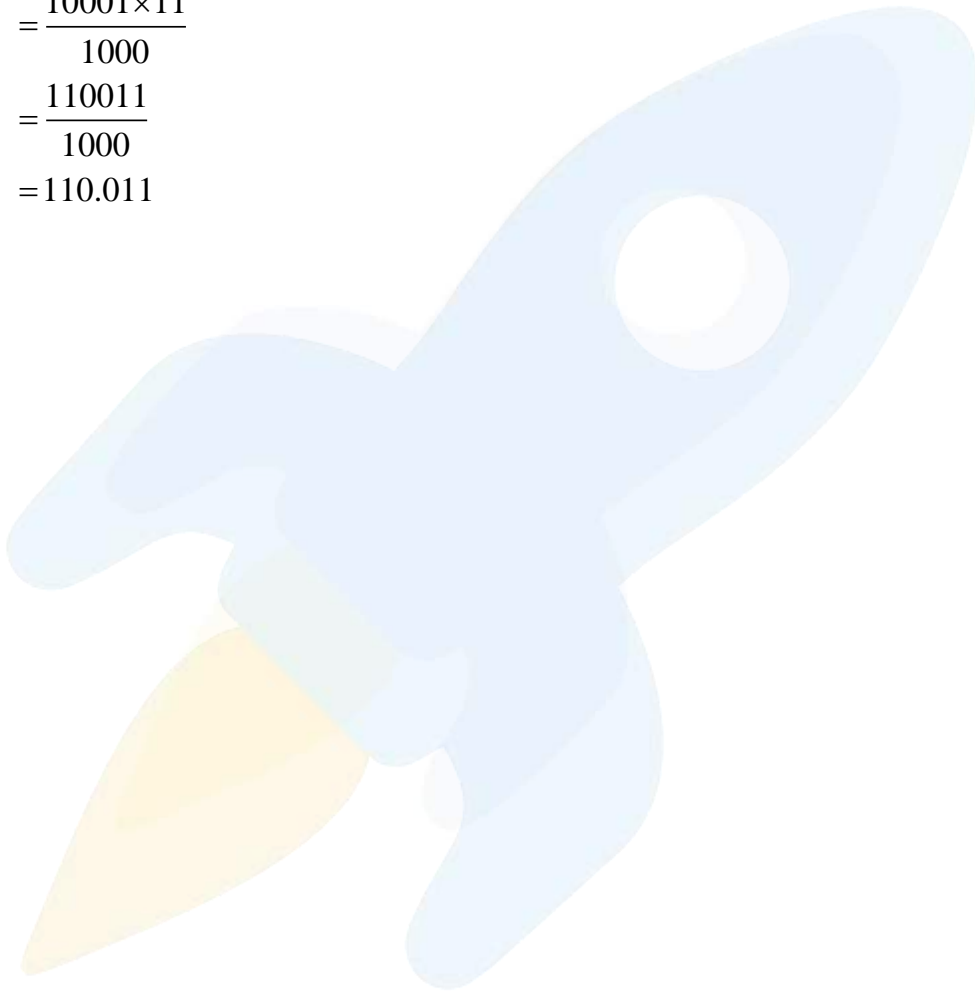
$$\begin{aligned} 10.05 \times 1.05 &= \frac{1005}{100} \times \frac{105}{100} \\ &= \frac{1005 \times 105}{10000} \\ &= \frac{105525}{10000} \\ &= 10.5525 \end{aligned}$$



$$\begin{aligned}101.01 \times 0.01 &= \frac{10101}{100} \times \frac{1}{100} \\ &= \frac{10101 \times 1}{10000} \\ &= \frac{10101}{10000} \\ &= 1.0101\end{aligned}$$

(x)

$$\begin{aligned}100.01 \times 1.1 &= \frac{10001}{100} \times \frac{11}{10} \\ &= \frac{10001 \times 11}{1000} \\ &= \frac{110011}{1000} \\ &= 110.011\end{aligned}$$



## Chapter-2: Fractions and Decimals

### Exercise 2.7 (Page 55 of Grade 7 NCERT)

**Q1.** Find

i)  $0.4 \div 2$

ii)  $0.35 \div 5$

iii)  $2.48 \div 4$

iv)  $65.4 \div 6$

v)  $651.2 \div 4$

vi)  $14.49 \div 7$

vii)  $3.96 \div 4$

viii)  $0.80 \div 5$

**Difficulty Level: Easy**

**What is known:**

One decimal number and one whole number.

**What is known:**

Quotient of following division.

**Reasoning:**

Covert decimal into fraction then divide it. To divide fractions, multiply the dividend with reciprocal of divisor.

**Solution:**

(i)

$$\begin{aligned} 0.4 \div 2 &= \frac{4}{10} \times \frac{1}{2} \left( 0.4 = \frac{4}{10} \right) \\ &= \frac{2}{10} \\ &= \frac{1}{5} \\ &= 0.2 \end{aligned}$$

(ii)

$$\begin{aligned} 0.35 \div 5 &= 0.35 \times \frac{1}{5} \\ &= \frac{35}{100} \times \frac{1}{5} \quad \left( \because 0.35 = \frac{35}{100} \right) \\ &= \frac{7}{100} \\ &= 0.07 \end{aligned}$$

$$\begin{aligned} 2.48 \div 4 &= 2.48 \times \frac{1}{4} \\ &= \frac{248}{100} \times \frac{1}{4} && \left( \because 2.48 = \frac{248}{100} \right) \\ &= \frac{62}{100} \\ &= 0.62 \end{aligned}$$

(iv)

$$\begin{aligned} 65.4 \div 6 &= 65.4 \times \frac{1}{6} \\ &= \frac{654}{10} \times \frac{1}{6} && \left( \because 65.4 = \frac{654}{10} \right) \\ &= \frac{109}{10} \\ &= 10.9 \end{aligned}$$

(v)

$$\begin{aligned} 651.2 \div 4 &= 651.2 \times \frac{1}{4} \\ &= \frac{6512}{10} \times \frac{1}{4} && \left( \because 651.2 = \frac{6512}{10} \right) \\ &= \frac{1628}{10} \\ &= 162.8 \end{aligned}$$

(vi)

$$\begin{aligned} 14.49 \div 7 &= 14.49 \times \frac{1}{7} \\ &= \frac{1449}{100} \times \frac{1}{7} && \left( \because 14.49 = \frac{1449}{100} \right) \\ &= \frac{1449}{700} \\ &= \frac{207}{100} \\ &= 2.07 \end{aligned}$$

$$\begin{aligned} 3.96 \div 4 &= 3.96 \times \frac{1}{4} \\ &= \frac{396}{100} \times \frac{1}{4} && \left( \because 3.96 = \frac{396}{100} \right) \\ &= \frac{396}{400} \\ &= \frac{99}{100} \\ &= 0.99 \end{aligned}$$

(viii)

$$\begin{aligned} 0.80 \div 5 &= 0.80 \times \frac{1}{5} \\ &= \frac{80}{100} \times \frac{1}{5} && \left( \because 0.80 = \frac{80}{100} \right) \\ &= \frac{16}{100} \\ &= 0.16 \end{aligned}$$

**Q2. Find:**

i)  $4.8 \div 10$

ii)  $52.5 \div 10$

iii)  $0.7 \div 10$

iv)  $33.1 \div 10$

v)  $272.23 \div 10$

vi)  $0.56 \div 10$

vii)  $3.97 \div 10$

**Difficulty Level: Easy**

**What is known:**

One decimal number and one whole number.

**What is known:**

Quotient of following division.

**Reasoning:**

Covert decimal into fraction then divide it. To divide fractions, multiply the dividend with reciprocal of divisor.

**Solution:**

(i)

$$\begin{aligned} 4.8 \div 10 &= 4.8 \times \frac{1}{10} \\ &= \frac{48}{10} \times \frac{1}{10} \\ &= \frac{48}{100} \\ &= 0.48 \end{aligned}$$

$$\begin{aligned} 52.5 \div 10 &= 52.5 \times \frac{1}{10} \\ &= \frac{525}{10} \times \frac{1}{10} \\ &= \frac{525}{100} \\ &= 5.25 \end{aligned}$$

(iii)

$$\begin{aligned} 0.7 \div 10 &= 0.7 \times \frac{1}{10} \\ &= \frac{7}{10} \times \frac{1}{10} \\ &= \frac{7}{100} \\ &= 0.07 \end{aligned}$$

(iv)

$$\begin{aligned} 33.1 \div 10 &= 33.1 \times \frac{1}{10} \\ &= \frac{331}{10} \times \frac{1}{10} \\ &= \frac{331}{100} \\ &= 3.31 \end{aligned}$$

(v)

$$\begin{aligned} 272.23 \div 10 &= 272.23 \times \frac{1}{10} \\ &= \frac{27273}{100} \times \frac{1}{10} \\ &= \frac{27273}{1000} \\ &= 27.273 \end{aligned}$$

(vi)

$$\begin{aligned} 0.56 \div 10 &= 0.56 \times \frac{1}{10} \\ &= \frac{56}{100} \times \frac{1}{10} \\ &= \frac{56}{1000} \\ &= 0.056 \end{aligned}$$

$$\begin{aligned} 3.97 \div 10 &= 3.97 \times \frac{1}{10} \\ &= \frac{397}{100} \times \frac{1}{10} \\ &= \frac{397}{1000} \\ &= 0.397 \end{aligned}$$

**Q3. Find:**

i)  $2.7 \div 100$

ii)  $0.3 \div 100$

iii)  $0.78 \div 100$

iv)  $432.6 \div 100$

v)  $23.6 \div 100$

vi)  $98.53 \div 100$

**Difficulty Level: Easy**

**What is known:**

One decimal number and one whole number.

**What is known:**

Quotient of following division.

**Reasoning:**

Covert decimal into fraction then divide it. To divide fractions, multiply the dividend with reciprocal of divisor.

**Solution:**

(i)

$$\begin{aligned} 2.7 \div 100 &= 2.7 \times \frac{1}{100} \\ &= \frac{27}{10} \times \frac{1}{100} \\ &= \frac{27}{1000} \\ &= 0.027 \end{aligned}$$

(ii)

$$\begin{aligned} 0.3 \div 100 &= 0.3 \times \frac{1}{100} \\ &= \frac{3}{10} \times \frac{1}{100} \\ &= \frac{3}{1000} \\ &= 0.003 \end{aligned}$$

$$\begin{aligned}0.78 \div 100 &= 0.78 \times \frac{1}{100} \\ &= \frac{78}{100} \times \frac{1}{100} \\ &= \frac{78}{10000} \\ &= 0.0078\end{aligned}$$

(iv)

$$\begin{aligned}432.6 \div 100 &= 432.6 \times \frac{1}{100} \\ &= \frac{4326}{10} \times \frac{1}{100} \\ &= \frac{4326}{1000} \\ &= 4.326\end{aligned}$$

(v)

$$\begin{aligned}23.6 \div 100 &= 23.6 \times \frac{1}{100} \\ &= \frac{236}{10} \times \frac{1}{100} \\ &= \frac{236}{1000} \\ &= 0.236\end{aligned}$$

(vi)

$$\begin{aligned}98.53 \div 100 &= 98.53 \times \frac{1}{100} \\ &= \frac{9853}{100} \times \frac{1}{100} \\ &= \frac{9853}{10000} \\ &= 0.9853\end{aligned}$$

**Q4. Find: -**

i)  $7.9 \div 1000$

ii)  $26.3 \div 1000$

iii)  $38.53 \div 1000$

iv)  $128.9 \div 1000$

v)  $0.5 \div 1000$

**Difficulty Level: Easy**

**What is known:**

One decimal number and one whole number.

Quotient of following division.

**Reasoning:**

Covert decimal into fraction then divide it. To divide fractions, multiply the dividend with reciprocal of divisor.

**Solution:**

(i)

$$\begin{aligned}7.9 \div 1000 &= 7.9 \times \frac{1}{1000} \\ &= \frac{79}{10} \times \frac{1}{1000} \\ &= \frac{79}{10000} \\ &= 0.0079\end{aligned}$$

(ii)

$$\begin{aligned}26.3 \div 1000 &= 26.3 \times \frac{1}{1000} \\ &= \frac{263}{10} \times \frac{1}{1000} \\ &= \frac{263}{10000} \\ &= 0.0263\end{aligned}$$

(iii)

$$\begin{aligned}38.53 \div 1000 &= 38.53 \times \frac{1}{1000} \\ &= \frac{3853}{100} \times \frac{1}{1000} \\ &= \frac{3853}{100000} \\ &= 0.03853\end{aligned}$$

(iv)

$$\begin{aligned}128.9 \div 1000 &= 128.9 \times \frac{1}{1000} \\ &= \frac{1289}{10} \times \frac{1}{1000} \\ &= \frac{1289}{10000} \\ &= 0.1289\end{aligned}$$



$$\begin{aligned}0.5 \div 1000 &= 0.5 \times \frac{1}{1000} \\ &= \frac{5}{10} \times \frac{1}{1000} \\ &= \frac{5}{10000} \\ &= 0.0005\end{aligned}$$

**Q5.** Find:

i)  $7 \div 3.5$

ii)  $36 \div 0.2$

iii)  $3.25 \div 0.5$

iv)  $30.94 \div 0.7$

v)  $0.5 \div 0.25$

vi)  $7.75 \div 0.25$

vii)  $76.5 \div 0.15$

viii)  $37.8 \div 1.4$

ix)  $2.73 \div 1.3$

**Difficulty Level: Moderate**

**What is known:**

Decimal numbers.

**What is known:**

Quotient of following division.

**Reasoning:**

Covert decimal into fraction then divide it. To divide fractions, multiply the dividend with reciprocal of divisor.

**Solution:**

(i)

$$\begin{aligned}7 \div 3.5 &= 7 \times \frac{1}{3.5} \\ &= \frac{7}{1} \times \frac{10}{35} \\ &= \frac{70}{35} \\ &= 2\end{aligned}$$

(ii)

$$\begin{aligned}36 \div 0.2 &= 36 \times \frac{1}{0.2} \\ &= \frac{36}{1} \times \frac{10}{2} \\ &= \frac{36 \times 10}{2} \\ &= 18 \times 10 \\ &= 180\end{aligned}$$

$$\begin{aligned} 3.25 \div 0.5 &= 3.25 \times \frac{1}{0.5} \\ &= \frac{325}{100} \times \frac{10}{5} \\ &= \frac{65}{10} \\ &= 6.5 \end{aligned}$$

(iv)

$$\begin{aligned} 30.94 \div 0.7 &= 30.94 \times \frac{1}{0.7} \\ &= \frac{3094}{100} \times \frac{10}{7} \\ &= \frac{3094}{70} \\ &= \frac{442}{10} \\ &= 44.2 \end{aligned}$$

(v)

$$\begin{aligned} 0.5 \div 0.25 &= 0.5 \times \frac{1}{0.25} \\ &= \frac{5}{10} \times \frac{100}{25} \\ &= \frac{50}{25} \\ &= 2 \end{aligned}$$

(vi)

$$\begin{aligned} 7.75 \div 0.25 &= 7.75 \times \frac{1}{0.25} \\ &= \frac{775}{100} \times \frac{100}{25} \\ &= \frac{775}{25} \\ &= 31 \end{aligned}$$

(vii)

$$\begin{aligned} 76.5 \div 0.15 &= 76.5 \times \frac{1}{0.15} \\ &= \frac{765}{10} \times \frac{100}{15} \\ &= \frac{7650}{15} \\ &= 510 \end{aligned}$$

$$\begin{aligned}37.8 \div 1.4 &= 37.8 \times \frac{1}{1.4} \\ &= \frac{378}{10} \times \frac{10}{14} \\ &= \frac{378}{14} \\ &= 27\end{aligned}$$

(ix)

$$\begin{aligned}2.73 \div 1.3 &= 2.73 \times \frac{1}{1.3} \\ &= \frac{273}{100} \times \frac{10}{13} \\ &= \frac{21}{10} \\ &= 2.1\end{aligned}$$

**Q6.** A vehicle covers a distance of 43.2 km in 2.4 liters of petrol. How much distance will it cover in 1 liter of petrol?

**Difficulty Level: Moderate**

**What is known:**

A vehicle covers a distance of 43.2 km in 2.4 liters of petrol.

**What is unknown:**

How much distance will it cover in 1 liter of petrol.

**Reasoning:**

By using Unitary Method, we can simply divide 43.2 by 2.4 to get how much distance will vehicle cover in 1 liter of petrol.

**Solution:**

Distance covered in 2.4 liters of petrol = 43.2 km

$$\begin{aligned}\therefore \text{Distance covered in 1 liter of petrol} &= 43.2 \div 2.4 \\ &= 43.2 \times \frac{1}{2.4} \\ &= \frac{432}{10} \times \frac{10}{24} \\ &= 18\text{km}\end{aligned}$$

Thus, it covers a distance of 18 km in 1 liter of petrol.

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