

Chapter 3

Decimals

Introduction

A decimal is a number which is expressed with a decimal point. It has two parts namely whole-number part and decimal part. In a decimal number, whole number part and fractional part is separated by a decimal point.

Like decimal: The decimals which are having the same number of digits on the right of the decimal point For example: 1.25, 2.36, 5.42 etc. They all are having two decimal places.

Unlike decimals: The decimals which are having unequal number of digits on the right of the decimal point. For example: 4.5, 2.75, 6.896 etc. In these examples, 4.5 has one decimal place, 2.75 has 2 decimal place and 6.896 has three decimal place.

Method for comparing decimals: We must follow below stated steps in order to compare decimal numbers.

Step1: Obtain the decimal numbers

Step2: Compare the whole parts of the numbers. The number with greater whole part will be greater. If the whole parts are equal, then follow the next step.

Step3: Compare the extreme left digits of the decimal parts of two numbers. The number with greater extreme left digit will be greater. If the extreme left digits of decimal parts are equal, then compare the next digits and so on.

Method for addition and subtraction of decimals:

Step1: Convert the given decimals to like decimals.

Step2: Write the decimals in columns with their decimal points directly below each other so that tenths come under tenths, hundredths come under hundredths and so on.

Step3: Add or subtract in the same way as we do in whole numbers.

Step4: Place the decimal point, in the answer, directly below the other decimal points.

Examples:

Example 1 – Which is greater of 48.23 and 39.35?

Solution: First we will compare the whole number part in the given decimal numbers.

Clearly, $48 > 39$

Therefore, $48.23 > 39.35$

Example 2 – Write the following decimals in ascending order:

5.64, 2.54, 3.05, 0.259 and 8.32

Solution: First, we will convert the given decimals into like decimal numbers as follows:

5.640, 2.540, 3.050, 0.259 and 8.320

Now, we will compare the whole numbers in all these decimals:

Clearly, $0 < 2 < 3 < 5 < 8$

Thus, $0.259 < 2.540 < 3.050 < 5.640 < 8.320$

Therefore, the given decimals in ascending order are:

0.259, 2.54, 3.05, 5.64, 8.32

Example 3 – Express the following decimals as fractions in lowest form:

(i) 0.05

Solution: Firstly, we remove the decimal point from the decimal number and the number obtained is to be taken as numerator which is (05). Then, insert as many zeros with 1 as there are number of places in the decimal part and number obtained is to be taken as denominator which is (100).

$$\text{We have, } 0.05 = \frac{005}{100} = \frac{5}{100} = \frac{1}{20}$$

(ii) 3.75

Solution: Firstly, we remove the decimal point from the decimal number and the number obtained is to be taken as numerator which is (375). Then, insert as many zeros with 1 as there are number of places in the decimal part and number obtained is to be taken as denominator which is (100).

$$\text{We have, } 3.75 = \frac{375}{100} = \frac{75}{20} = \frac{15}{4}$$

(iii) 0.004

Solution: Firstly, we remove the decimal point from the decimal number and the number obtained is to be taken as numerator which is (0004). Then, insert as many zeros with 1 as there are number of places in the decimal part and number obtained is to be taken as denominator which is (1000).

$$\text{We have, } 0.004 = \frac{0004}{1000} = \frac{4}{1000} = \frac{1}{250}$$

(iv) 5.066

Solution: Firstly, we remove the decimal point from the decimal number and the number obtained is to be taken as numerator which is (5066). Then, insert as many zeros with 1 as there are number of places in the decimal part and number obtained is to be taken as denominator which is (1000).

$$\text{We have, } 5.066 = \frac{5066}{1000} = \frac{2533}{500}$$

Example 4 – Express the following fractions as decimals:

(i) $\frac{2}{10}$

Solution: Here, denominator is 10. Thus, we write numerator and mark decimal point after one place from right towards left.

$$\text{Therefore, } \frac{2}{10} = 0.2$$

(ii) $\frac{1359}{1000}$

Solution: Here, denominator is 1000. Thus, we write numerator and mark decimal point after three places from right towards left.

Therefore, $\frac{1359}{1000} = 1.359$

(iii) $7\frac{1}{2}$

Solution: we can write $7\frac{1}{2}$ as $7 + \frac{1}{2}$

Now, consider $\frac{1}{2}$ and convert its denominator as 10

So, we must multiply each term in $\frac{1}{2}$ by 5 to make denominator as 10

$$\frac{1}{2} = \frac{1 \times 5}{2 \times 5} = \frac{5}{10}$$

Thus, we have $7 + \frac{5}{10} = 7 + 0.5 = 7.5$

(iv) $9\frac{1}{4}$

Solution: we can write $9\frac{1}{4}$ as $9 + \frac{1}{4}$

Now, consider $\frac{1}{4}$ and convert its denominator as 100

So, we must multiply each term in $\frac{1}{4}$ by 25 to make denominator as 100

$$\frac{1}{4} = \frac{1 \times 25}{4 \times 25} = \frac{25}{100}$$

Thus, we have $9 + \frac{25}{100} = 9 + 0.25 = 9.25$

(v) $12\frac{1}{8}$

Solution: we can write $12\frac{1}{8}$ as $12 + \frac{1}{8}$

Now, consider $\frac{1}{8}$ and convert its denominator as 1000

So, we must multiply each term in $\frac{1}{8}$ by 125 to make denominator as 1000

$$\frac{1}{8} = \frac{1 \times 125}{8 \times 125} = \frac{125}{1000}$$

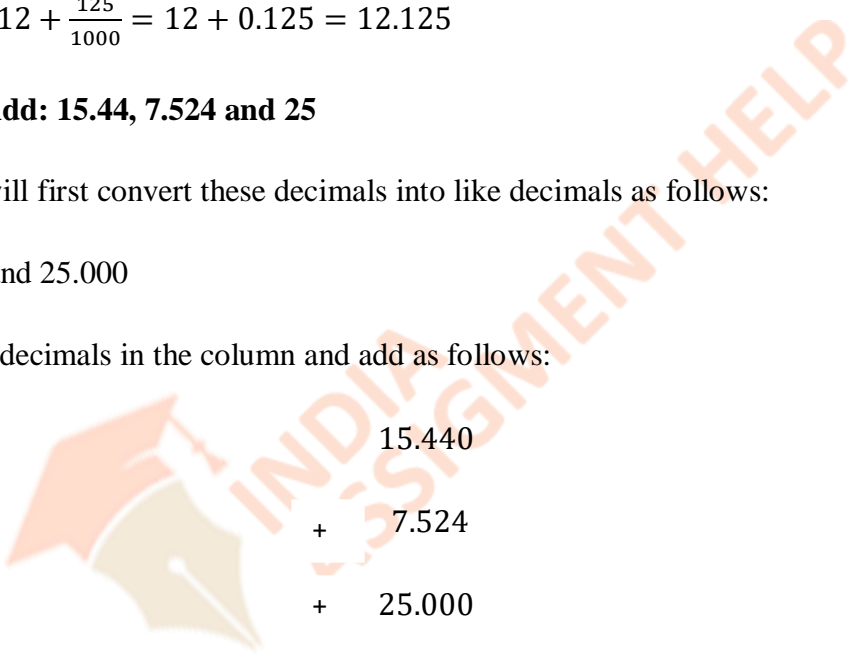
Thus, we have $12 + \frac{125}{1000} = 12 + 0.125 = 12.125$

Example 5 – Add: 15.44, 7.524 and 25

Solution: We will first convert these decimals into like decimals as follows:

15.440, 7.524 and 25.000

Now, we write decimals in the column and add as follows:


$$\begin{array}{r} 15.440 \\ + 7.524 \\ + 25.000 \\ \hline 47.964 \end{array}$$

Example 6 – Aakash bought vegetables weighing 10 kg. Out of this 3 kg 500 g is onion, 2 kg 75 g is tomato and the rest is potato. What is the weight of potato?

Solution: It is given that total weight of vegetables = 10 kg

Since, 1 kg = 1000 g

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

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

Weight of onion = 3 kg 500 g

$$= 3 + \frac{500}{1000} = 3 + 0.500 = 3.500 \text{ kg}$$

Weight of tomato = 2 kg 75 g

$$= 2 + \frac{75}{1000} = 2 + 0.075 = 2.075 \text{ kg}$$

Total weight of onion and tomato:

$$\begin{array}{r} 3.500 \\ + 2.075 \\ \hline 5.575 \text{ Kg} \end{array}$$

Therefore, weight of potato = (total weight of vegetables) – (total weight of tomato and onion)

$$= (10 - 5.575) \text{ kg}$$

$$\begin{array}{r} 10.000 \\ - 5.575 \\ \hline 4.425 \text{ Kg} \end{array}$$

Thus, weight of potato = 4.425 kg

Example 7 – Simplify: $36.65 - 15.79 + 85.2 - 57.615$

Solution: We will first convert the given decimals into like decimals as follows:

$$= 36.650 - 15.790 + 85.200 - 57.615$$

$$= (36.650 + 85.200) - (15.790 + 57.615)$$

$$\begin{array}{r} 36.650 \\ + 85.200 \\ \hline 121.850 \end{array}$$

$$\begin{array}{r}
 15.790 \\
 + 57.615 \\
 \hline
 73.405 \\
 \hline
 \end{array}$$

$$\begin{aligned}
 &\text{Thus, } (36.650 + 85.200) - (15.790 + 57.615) \\
 &= 121.850 - 73.405 = 48.445
 \end{aligned}$$

$$\begin{array}{r}
 121.850 \\
 - 73.405 \\
 \hline
 48.445 \\
 \hline
 \end{array}$$

Exercise 3.1

Question 1 – Write each of the following as decimals:

(i) $\frac{8}{100}$

Solution: Here, denominator is 100. Thus, we write numerator and mark decimal point after two places from right towards left.

Therefore, $\frac{8}{100} = 0.08$

(ii) $20 + \frac{9}{10} + \frac{4}{100}$

Solution: $\frac{9}{10}$ has denominator as 10. Thus, we write numerator and mark decimal point after one place from right towards left and we get $\frac{9}{10} = 0.9$

$\frac{4}{100}$ has denominator as 100. Thus, we write numerator and mark decimal point after two places from right towards left and we get $\frac{4}{100} = 0.04$

Thus, we have $20 + 0.9 + 0.04 = 20.00 + 0.90 + 0.04 = 20.94$

(iii) $23 + \frac{2}{10} + \frac{6}{1000}$

Solution: $\frac{2}{10}$ has denominator as 10. Thus, we write numerator and mark decimal point after one place from right towards left and we get $\frac{2}{10} = 0.2$

$\frac{6}{1000}$ has denominator as 1000. Thus, we write numerator and mark decimal point after three places from right towards left and we get $\frac{6}{1000} = 0.006$

Thus, we have $23 + 0.2 + 0.006 = 23.000 + 0.200 + 0.006 = 23.206$

Question 2 – Convert each of the following into fractions in the lowest form:

(i) 0.04

Solution: Firstly, we remove the decimal point from the decimal number and the number obtained is to be taken as numerator which is (004). Then, insert as many zeros with 1 as there are number of places in the decimal part and number obtained is to be taken as denominator which is (100).

We have, $0.04 = \frac{004}{100} = \frac{4}{100} = \frac{1}{25}$

(ii) 2.34

Solution: Firstly, we remove the decimal point from the decimal number and the number obtained is to be taken as numerator which is (234). Then, insert as many zeros with 1 as there are number of places in the decimal part and number obtained is to be taken as denominator which is (100).

We have, $2.34 = \frac{234}{100} = \frac{117}{50}$

(iii) 0.342

Solution: Firstly, we remove the decimal point from the decimal number and the number obtained is to be taken as numerator which is (342). Then, insert as many zeros with 1 as there

are number of places in the decimal part and number obtained is to be taken as denominator which is (1000).

$$\text{We have, } 0.342 = \frac{342}{1000} = \frac{171}{500}$$

(iv) 17.38

Solution: Firstly, we remove the decimal point from the decimal number and the number obtained is to be taken as numerator which is (1738). Then, insert as many zeros with 1 as there are number of places in the decimal part and number obtained is to be taken as denominator which is (100).

$$\text{We have, } 17.38 = \frac{1738}{100} = \frac{869}{50}$$

Question 3 – Express the following fractions as decimals:

(i) $\frac{23}{10}$

Solution: Here, denominator is 10. Thus, we write numerator and mark decimal point after one place from right towards left.

Therefore, $\frac{23}{10} = 2.3$

(ii) $25\frac{1}{8}$

Solution: we can write $25\frac{1}{8}$ as $25 + \frac{1}{8}$

Now, consider $\frac{1}{8}$ and convert its denominator as 1000

So, we must multiply each term in $\frac{1}{8}$ by 125 to make denominator as 1000

$$\frac{1}{8} = \frac{1 \times 125}{8 \times 125} = \frac{125}{1000}$$

Thus, we have $25 + \frac{125}{1000} = 25 + 0.125 = 25.125$

(iii) $39\frac{7}{35}$

Solution: we can write $39\frac{7}{35}$ as $39 + \frac{7}{35}$

Now, $\frac{7}{35} = \frac{1}{5}$

Now, consider $\frac{1}{5}$ and convert its denominator as 10

So, we must multiply each term in $\frac{1}{5}$ by 2 to make denominator as 10

$$\frac{1}{5} = \frac{1 \times 2}{5 \times 2} = \frac{2}{10}$$

Thus, we have $39 + \frac{7}{35} = 39 + 0.2 = 39.2$

(iv) $15\frac{1}{25}$

Solution: we can write $15\frac{1}{25}$ as $15 + \frac{1}{25}$

Now, consider $\frac{1}{25}$ and convert its denominator as 100

So, we must multiply each term in $\frac{1}{25}$ by 4 to make denominator as 100

$$\frac{1}{25} = \frac{1 \times 4}{25 \times 4} = \frac{4}{100}$$

Thus, we have $15 + \frac{1}{25} = 15 + 0.04 = 15.00 + 0.04 = 15.04$

Question 4 – Add the following:

(i) 41.8, 39.24, 5.01 and 62.6

Solution: We will first convert these decimals into like decimals as follows:

41.80, 39.24, 5.01 and 62.60

Now, we write decimals in the column and add as follows:

$$\begin{array}{r}
 41.80 \\
 39.24 \\
 + 5.01 \\
 + 62.60 \\
 \hline
 148.65 \\
 \hline
 \end{array}$$

(ii) 18.03, 146.3, 0.829 and 5.324

Solution: We will first convert these decimals into like decimals as follows:

18.030, 146.300, 0.829 and 5.324

Now, we write decimals in the column and add as follows:

$$\begin{array}{r}
 18.030 \\
 146.300 \\
 + 0.829 \\
 + 5.324 \\
 \hline
 170.483 \\
 \hline
 \end{array}$$

Question 5 – Find the value of:

(i) 9.756 – 6.28

Solution: We will first convert these decimals into like decimals as follows:

9.756 and 6.280

Now, we write decimals in the column and subtract as follows:

$$\begin{array}{r} 9.756 \\ - 6.280 \\ \hline 3.476 \end{array}$$

(ii) 48.1 – 0.37

Solution: We will first convert these decimals into like decimals as follows:

48.10 and 0.37

Now, we write decimals in the column and subtract as follows:

$$\begin{array}{r} 48.10 \\ - 0.37 \\ \hline 47.73 \end{array}$$

(iii) 108.032 – 86.8

Solution: We will first convert these decimals into like decimals as follows:

108.032 and 86.800

Now, we write decimals in the column and subtract as follows:

$$\begin{array}{r} 108.032 \\ - 86.800 \\ \hline 21.232 \end{array}$$

(iv) 100 – 26.32

Solution: We will first convert these decimals into like decimals as follows:

100.00 and 26.32

Now, we write decimals in the column and subtract as follows:

$$\begin{array}{r}
 100.00 \\
 - 26.32 \\
 \hline
 73.68 \\
 \hline
 \end{array}$$

Question 6 – Take out 3.547 from 7.2

Solution: We will find $7.2 - 3.547$

We will first convert these decimals into like decimals as follows:

7.200 and 3.547

Now, we write decimals in the column and subtract as follows:

$$\begin{array}{r}
 7.200 \\
 - 3.547 \\
 \hline
 3.653 \\
 \hline
 \end{array}$$

Question 7 – What is to be added to 36.85 to get 59.41?

Solution: Let the required number be 'x'

Then, $36.85 + x = 59.41$

$\Rightarrow x = 59.41 - 36.85$

Now, we write decimals in the column and subtract as follows:

$$\begin{array}{r}
 59.41 \\
 - 36.85 \\
 \hline
 22.56 \\
 \hline
 \end{array}$$

Therefore, $x = 22.56$

Question 8 – What is to be subtracted from 17.1 to get 2.051?

Solution: Let the required number be 'x'

$$\text{Then, } 17.1 - x = 2.051$$

$$\Rightarrow 17.1 - 2.051 = x$$

We will first convert these decimals into like decimals as follows:

17.100 and 2.051

Now, we write decimals in the column and subtract as follows:

$$\begin{array}{r} 17.100 \\ - 2.051 \\ \hline 15.049 \end{array}$$

Therefore, $x = 15.049$

Question 9 – By how much should 34.79 be increased to get 70.15?

Solution: Let the required number be 'x'

$$\text{Then, } 34.79 + x = 70.15$$

$$\Rightarrow x = 70.15 - 34.79$$

Now, we write decimals in the column and subtract as follows:

$$\begin{array}{r} 70.15 \\ - 34.79 \\ \hline 35.36 \end{array}$$

Therefore, $x = 35.36$

Question 10 – By how much should 59.71 be decreased to get 34.58?

Solution: Let the required number be 'x'

$$\text{Then, } 59.71 - x = 34.58$$

$$\Rightarrow 59.71 - 34.58 = x$$

Now, we write decimals in the column and subtract as follows:

$$\begin{array}{r} 59.71 \\ - 34.58 \\ \hline 25.13 \end{array}$$

Therefore, $x = 25.13$

Multiplication of decimals

There are some rules for multiplication of decimals which are as follows:

Rule 1: When we multiply a decimal by 10, the decimal point is shifted to the right by one place

Rule 2: When we multiply a decimal by 100, the decimal point is shifted to the right by two places.

Rule 3: When we multiply a decimal by 1000, the decimal point is shifted to the right by three places, and so on.

Rule 4: When we multiply a decimal by a whole number, then we first multiply the decimal without the decimal point by whole number and then put decimal point in the product as per the decimal place in the given decimal.

Examples

Example 1 – Find the value of:

(i) 3.45×10

Solution: Here, a decimal is multiplied by 10, thus we shift decimal point to the right by one place.

We have, $3.45 \times 10 = 34.5$

(ii) 0.25×10000

Solution: Here, a decimal is multiplied by 10000, thus we shift decimal point to the right by four places.

We have, $0.25 \times 10000 = 0.2500 \times 10000 = 2500$

(iii) 1000×5.29

Solution: Here, a decimal is multiplied by 1000, thus we shift decimal point to the right by three places.

We have, $1000 \times 5.29 = 1000 \times 5.290 = 5290$

(iv) 10000×0.01

Solution: Here, a decimal is multiplied by 10000, thus we shift decimal point to the right by four places.

We have, $10000 \times 0.01 = 10000 \times 0.0100 = 0100 = 100$

Example 2 – Multiply 7.43 by 14.1

Solution: Here, a decimal is multiplied by another decimal. Thus, we multiply both decimals without decimal point and then we insert the decimal point as per the given decimal places.

So, first we simply solve 743×141 as follows:

$$\begin{array}{r} 743 \\ \times 141 \\ \hline 743 \\ 29720 \\ + 74300 \\ \hline 104763 \end{array}$$

Now, 7.43×14.1 has total of 3 decimal places.

Thus, we put decimal point in the product by counting three places from right to left.

Therefore, $7.43 \times 14.1 = 104.763$

Example 3 – Find the product 0.008×0.74

Solution: Here, a decimal is multiplied by another decimal. Thus, we multiply both decimals without decimal point and then we insert the decimal point as per the given decimal places.

So, first we simply solve 8×74 as follows:

$$\begin{array}{r} 74 \\ \times 8 \\ \hline 592 \end{array}$$

Now, 0.008×0.74 has total of 5 decimal places.

Thus, we put decimal point in the product by counting five places from right to left.

Therefore, $0.008 \times 0.74 = 0.00592$

Example 4 – Find the area of a rectangle whose length is 5.7 cm and breadth is 3.5 cm.

Solution: It is given that, length of rectangle = 5.7 cm

Breadth of rectangle = 3.5 cm

We know that, area of rectangle = length \times breadth

$$\text{Area} = (5.7 \times 3.5) \text{ cm}^2$$

Now, a decimal is multiplied by another decimal. Thus, we multiply both decimals without decimal point and then we insert the decimal point as per the given decimal places.

So, first we simply solve 57×35 as follows:

$$\begin{array}{r} 57 \\ \times 35 \\ \hline 285 \\ + 1710 \\ \hline 1995 \end{array}$$

Now, 5.7×3.5 has total of 2 decimal places.

Thus, we put decimal point in the product by counting two places from right to left.

$$\Rightarrow 5.7 \times 3.5 = 19.95 \text{ cm}^2$$

Therefore, area of rectangle = 19.95 cm^2

Example 5 – A two wheeler covers a distance of 55.4 km in one litre of petrol. How much distance will it cover in 7.5 litres of petrol?

Solution: It is given that, distance covered in 1 litre of petrol = 55.4 km

$$\Rightarrow \text{Distance covered in 7.5 litres of petrol} = (55.4 \times 7.5) \text{ km}$$

Now, a decimal is multiplied by another decimal. Thus, we multiply both decimals without decimal point and then we insert the decimal point as per the given decimal places.

So, first we simply solve 554×75 as follows:

$$\begin{array}{r} 554 \\ \times 75 \\ \hline 2770 \\ + 38780 \\ \hline 41550 \end{array}$$

Now, 55.4×7.5 has total of 2 decimal places.

Thus, we put decimal point in the product by counting two places from right to left.

$$\Rightarrow 55.4 \times 7.5 = 415.50 \text{ km}$$

Therefore, Distance covered in 7.5 litres of petrol = 415.50 km

Example 6 – If 1 kg of pure milk contains 0.245 kg of fat. How much fat is there is 14.4 kg of milk?

Solution: It is given that, quantity of fat in 1 kg of milk = 0.245 kg

Thus, quantity of fat in 14.4 kg of milk = (0.245×14.4) kg

Now, a decimal is multiplied by another decimal. Thus, we multiply both decimals without decimal point and then we insert the decimal point as per the given decimal places.

So, first we simply solve 245×144 as follows:

$$\begin{array}{r}
 245 \\
 \times 144 \\
 \hline
 980 \\
 9800 \\
 + 24500 \\
 \hline
 35280
 \end{array}$$

Now, 0.245×14.4 has total of 4 decimal places.

Thus, we put decimal point in the product by counting four places from right to left.

$$\Rightarrow 0.245 \times 14.4 = 3.5280 \text{ kg}$$

Therefore, quantity of fat in 14.4 kg of milk = 3.5280 kg

Exercise 3.2

Question 1 – Find the product:

(i) 4.74×10

Solution: Here, a decimal is multiplied by 10, thus we shift decimal point to the right by one place.

$$\text{We have, } 4.74 \times 10 = 47.4$$

(ii) 0.45×10

Solution: Here, a decimal is multiplied by 10, thus we shift decimal point to the right by one place.

$$\text{We have, } 0.45 \times 10 = 4.5$$

(iii) 0.0215×10

Solution: Here, a decimal is multiplied by 10, thus we shift decimal point to the right by one place.

We have, $0.0215 \times 10 = 0.215$

(iv) 0.0054×10

Solution: Here, a decimal is multiplied by 10, thus we shift decimal point to the right by one place.

We have, $0.0054 \times 10 = 0.054$

Question 2 – Find the product:

(i) 35.853×100

Solution: Here, a decimal is multiplied by 100, thus we shift decimal point to the right by two places.

We have, $35.853 \times 100 = 3585.3$

(ii) 42.5×100

Solution: Here, a decimal is multiplied by 100, thus we shift decimal point to the right by two places.

We have, $42.5 \times 100 = 42.50 \times 100 = 4250$

(iii) 12.075×100

Solution: Here, a decimal is multiplied by 100, thus we shift decimal point to the right by two places.

We have, $12.075 \times 100 = 1207.5$

(iv) 100×0.005

Solution: Here, a decimal is multiplied by 100, thus we shift decimal point to the right by two places.

We have, $100 \times 0.005 = 0.5$

Question 3 – Find the product:

(i) 2.506×1000

Solution: Here, a decimal is multiplied by 1000, thus we shift decimal point to the right by three places.

We have, $2.506 \times 1000 = 2506$

(ii) 20.708×1000

Solution: Here, a decimal is multiplied by 1000, thus we shift decimal point to the right by three places.

We have, $20.708 \times 1000 = 20708$

(iii) 0.0529×1000

Solution: Here, a decimal is multiplied by 1000, thus we shift decimal point to the right by three places.

We have, $0.0529 \times 1000 = 52.9$

(iv) 1000×0.1

Solution: Here, a decimal is multiplied by 1000, thus we shift decimal point to the right by three places.

We have, $1000 \times 0.1 = 1000 \times 0.100 = 100$

Question 4 – Find the product:

(i) 3.4×17

Solution: Here, a decimal is multiplied by whole number. Thus, we multiply decimal without decimal point by whole number and then we insert the decimal point as per the given decimal places.

So, first we simply solve 34×17 as follows:

$$\begin{array}{r} 34 \\ \times 17 \\ \hline 238 \\ + 340 \\ \hline 578 \end{array}$$

Now, 3.4×17 has total of 1 decimal place.

Thus, we put decimal point in the product by counting one places from right to left.

Therefore, $3.4 \times 17 = 57.8$

(ii) 0.745×12

Solution: Here, a decimal is multiplied by whole number. Thus, we multiply decimal without decimal point by whole number and then we insert the decimal point as per the given decimal places.

So, first we simply solve 745×12 as follows:

$$\begin{array}{r}
 745 \\
 \times 12 \\
 \hline
 1490 \\
 + 7450 \\
 \hline
 8940
 \end{array}$$

Now, 0.745×12 has total of 3 decimal places.

Thus, we put decimal point in the product by counting three places from right to left.

Therefore, $0.745 \times 12 = 8.94$

(iii) 28.73×47

Solution: Here, a decimal is multiplied by whole number. Thus, we multiply decimal without decimal point by whole number and then we insert the decimal point as per the given decimal places.

So, first we simply solve 2873×47 as follows:

$$\begin{array}{r}
 2873 \\
 \times 47 \\
 \hline
 20111 \\
 + 114920 \\
 \hline
 135031
 \end{array}$$

Now, 28.73×47 has total of 2 decimal places.

Thus, we put decimal point in the product by counting two places from right to left.

Therefore, $28.73 \times 47 = 1350.31$

(iv) 0.0415×59

Solution: Here, a decimal is multiplied by whole number. Thus, we multiply decimal without decimal point by whole number and then we insert the decimal point as per the given decimal places.

So, first we simply solve 415×59 as follows:

$$\begin{array}{r} 415 \\ \times 59 \\ \hline 3735 \\ + 20750 \\ \hline 24485 \end{array}$$

Now, 0.0415×59 has total of 4 decimal places.

Thus, we put decimal point in the product by counting four places from right to left.

Therefore, $0.0415 \times 59 = 2.4485$

Question 5 – Find:

(i) 1.07×0.02

Solution: Here, a decimal is multiplied by another decimal. Thus, we multiply both decimals without decimal point and then we insert the decimal point as per the given decimal places.

So, first we simply solve 107×2 as follows:

$$\begin{array}{r} 107 \\ \times 2 \\ \hline 214 \end{array}$$

Now, 1.07×0.02 has total of 4 decimal places.

Thus, we put decimal point in the product by counting four places from right to left.

Therefore, $1.07 \times 0.02 = 0.0214$

(ii) 211.9×1.13

Solution: Here, a decimal is multiplied by another decimal. Thus, we multiply both decimals without decimal point and then we insert the decimal point as per the given decimal places.

So, first we simply solve 2119×113 as follows:

$$\begin{array}{r} 2119 \\ \times 113 \\ \hline 6357 \\ 21190 \\ + 211900 \\ \hline 239447 \end{array}$$

Now, 211.9×1.13 has total of 3 decimal places.

Thus, we put decimal point in the product by counting three places from right to left.

Therefore, $211.9 \times 1.13 = 239.447$

(iii) 10.05×1.05

Solution: Here, a decimal is multiplied by another decimal. Thus, we multiply both decimals without decimal point and then we insert the decimal point as per the given decimal places.

So, first we simply solve 1005×105 as follows:

$$\begin{array}{r}
 1005 \\
 \times 105 \\
 \hline
 5025 \\
 0000 \\
 + 100500 \\
 \hline
 105525
 \end{array}$$

Now, 10.05×1.05 has total of 4 decimal places.

Thus, we put decimal point in the product by counting four places from right to left.

Therefore, $10.05 \times 1.05 = 10.5525$

(iv) 13.01×5.01

Solution: Here, a decimal is multiplied by another decimal. Thus, we multiply both decimals without decimal point and then we insert the decimal point as per the given decimal places.

So, first we simply solve 1301×501 as follows:

$$\begin{array}{r}
 1301 \\
 \times 501 \\
 \hline
 1301 \\
 0000 \\
 + 650500 \\
 \hline
 651801
 \end{array}$$

Now, 13.01×5.01 has total of 4 decimal places.

Thus, we put decimal point in the product by counting four places from right to left.

Therefore, $13.01 \times 5.01 = 65.1801$

Question 6 – Find the area of a rectangle whose length is 5.5 m and breadth is 3.4 m.

Solution: It is given that, length of rectangle = 5.5 m

Breadth of rectangle = 3.4 m

We know that, area of rectangle = length \times breadth

$$\text{Area} = (5.5 \times 3.4)m^2$$

Now, a decimal is multiplied by another decimal. Thus, we multiply both decimals without decimal point and then we insert the decimal point as per the given decimal places.

So, first we simply solve 55×34 as follows:

$$\begin{array}{r} 55 \\ \times 34 \\ \hline 220 \\ + 1650 \\ \hline 1870 \end{array}$$

Now, 5.5×3.4 has total of 2 decimal places.

Thus, we put decimal point in the product by counting two places from right to left.

$$\Rightarrow 5.5 \times 3.4 = 18.70 m^2$$

Therefore, area of rectangle = $18.70 m^2$

Question 7 – If the cost of a book is Rs 25.75, find the cost of 24 such books.

Solution: It is given that, cost of 1 book = Rs 25.75

Thus, cost of 24 books = Rs (25.75×24)

So, first we simply solve 2575×24 as follows:

$$\begin{array}{r} 2575 \\ \times 24 \\ \hline 10300 \\ + 51500 \\ \hline 61800 \end{array}$$

Now, 25.75×24 has total of 2 decimal places.

Thus, we put decimal point in the product by counting two places from right to left.

Therefore, $25.75 \times 24 = \text{Rs } 618.00 = \text{Rs } 618$

Question 8 – A car covers a distance of 14.75 km in one litre of petrol. How much distance will it cover in 15.5 litres of petrol?

Solution: It is given that, distance covered in 1 litre of petrol = 14.75 km

=> Distance covered in 15.5 litres of petrol = (14.75×15.5) km

Now, a decimal is multiplied by another decimal. Thus, we multiply both decimals without decimal point and then we insert the decimal point as per the given decimal places.

So, first we simply solve 1475×155 as follows:

$$\begin{array}{r} 1475 \\ \times 155 \\ \hline 7375 \\ + 73750 \\ + 147500 \\ \hline 228625 \end{array}$$

Now, 14.75×15.5 has total of 3 decimal places.

Thus, we put decimal point in the product by counting three places from right to left.

$$\Rightarrow 14.75 \times 15.5 = 228.625 \text{ km}$$

Therefore, Distance covered in 15.5 litres of petrol = 228.625 km

Question 9 – One kg of rice costs Rs 42.65. What will be the cost of 18.25 kg of rice?

Solution: It is given that, cost of 1 kg of rice = Rs 42.65

Thus, cost of 18.25 kg of rice = Rs (42.65×18.25)

So, first we simply solve 4265×1825 as follows:

$$\begin{array}{r} 4265 \\ \times 1825 \\ \hline 21325 \\ + 85300 \\ + 3412000 \\ + 4265000 \\ \hline 7783625 \end{array}$$

Now, 42.65×18.25 has total of 4 decimal places.

Thus, we put decimal point in the product by counting four places from right to left.

Therefore, $42.65 \times 18.25 = \text{Rs } 778.3625$

Question 10 – One metre of cloth costs Rs 152.50. What is the cost of 10.75 metres of cloth?

Solution: It is given that, cost of 1 m of cloth = Rs 152.50

Thus, cost of 10.75 m cloth = Rs (152.50 × 10.75)

So, first we simply solve 15250 × 1075 as follows:

$$\begin{array}{r} 15250 \\ \times 1075 \\ \hline 76250 \\ + 1067500 \\ + 0000000 \\ + 15250000 \\ \hline 16393750 \end{array}$$

Now, 152.50×10.75 has total of 4 decimal places.

Thus, we put decimal point in the product by counting four places from right to left.

Therefore, $152.50 \times 10.75 = \text{Rs } 1639.3750$

Division of decimals:

There are some rules for division of decimals which are as follows:

Rule 1: When we divide a decimal by 10, the decimal point is shifted to the left by one place

Rule 2: When we divide a decimal by 100, the decimal point is shifted to the left by two places.

Rule 3: When we divide a decimal by 1000, the decimal point is shifted to the left by three places, and so on.

Rule 4: When we divide a decimal by a whole number, then we follow the steps as follows:

Step1: Check the whole number part of the dividend

Step2: If whole number part of dividend is less than the divisor, then place a 0 in the ones place in the quotient. Otherwise, go to next step.

Step3: Divide the whole number part of the dividend.

Step4: Place the decimal point to the right of ones place in the quotient obtained in step 1.

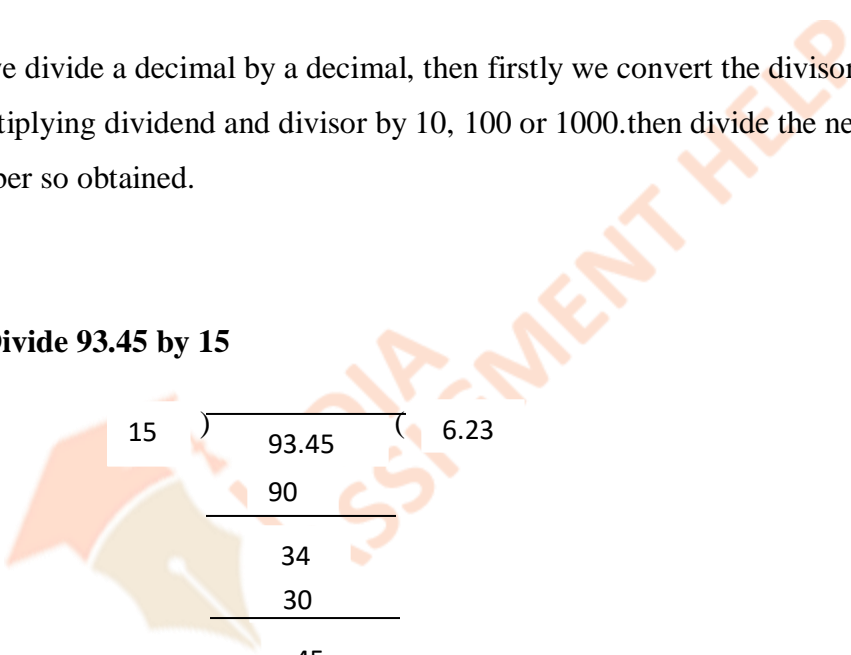
Step5: Divide the decimal part of the dividend by the divisor. If the digits of dividend are exhausted, then place zeros to the right of dividend and remainder each time and continue the process.

Rule5: When we divide a decimal by a decimal, then firstly we convert the divisor into whole number by multiplying dividend and divisor by 10, 100 or 1000. then divide the new dividend by the whole number so obtained.

Examples:

Example 1 – Divide 93.45 by 15

Solution:


$$\begin{array}{r} 15 \overline{) 93.45} \quad 6.23 \\ \underline{90} \\ 34 \\ \underline{30} \\ 45 \\ \underline{45} \\ 0 \end{array}$$

Therefore, Quotient = 6.23

Example 2 - Divide 8.28 by 12

Solution: Since Dividend < divisor. Thus, we will proceed as follows:

We can write it as $\frac{8.28}{12} = \frac{828}{12 \times 100}$

Firstly, we simply divide 828 by 12 as follows:

$$\begin{array}{r}
 12 \overline{) 828} \quad 69 \\
 \underline{72} \\
 108 \\
 \underline{108} \\
 0
 \end{array}$$

Thus, we get $\frac{828}{12} = 69$

$$\Rightarrow \frac{828}{12 \times 100} = \frac{69}{100} = 0.69$$

Therefore, Quotient = 0.69

Example 3 – Divide 0.6204 by 5

Solution: Since Dividend < divisor. Thus, we will proceed as follows:

$$\text{We can write it as } \frac{0.62040}{5} = \frac{62040}{5 \times 100000}$$

Firstly, we simply divide 62040 by 5 as follows:

$$\begin{array}{r}
 5 \overline{) 62040} \quad 12408 \\
 \underline{5} \\
 12 \\
 \underline{10} \\
 20 \\
 \underline{20} \\
 40 \\
 \underline{40} \\
 0
 \end{array}$$

Thus, we get $\frac{62040}{5} = 12408$

$$\Rightarrow \frac{62040}{5 \times 100000} = \frac{12408}{100000} = 0.12408$$

Therefore, Quotient = 0.12408

Example 4 – Divide 28.82 by 20

Solution:

$$\begin{array}{r} 20 \overline{) 28.820} \quad 1.441 \\ \underline{20} \\ 88 \\ \underline{80} \\ 82 \\ \underline{80} \\ 20 \\ \underline{20} \\ 0 \end{array}$$

Therefore, Quotient = 1.441

Example 5 – Divide 48.08 by 400

Solution: Since Dividend < divisor. Thus, we will proceed as follows:

We can write it as $\frac{48.08}{400} = \frac{4808}{400 \times 100} = \frac{4808}{4 \times 10000}$

Firstly, we simply divide 4808 by 4 as follows:

$$\begin{array}{r} 4 \overline{) 4808} \quad 1202 \\ \underline{4} \\ 8 \\ \underline{8} \\ 08 \\ \underline{08} \\ 0 \end{array}$$

Thus, we get $\frac{4808}{4} = 1202$

$$\Rightarrow \frac{4808}{4 \times 10000} = \frac{1202}{10000} = 0.1202$$

Therefore, Quotient = 0.1202

Example 6 – Divide 163.44 by 24

Solution:

$$\begin{array}{r}
 24 \overline{) 163.44} \quad 6.81 \\
 \underline{144} \\
 194 \\
 \underline{192} \\
 24 \\
 \underline{24} \\
 0
 \end{array}$$

Therefore, Quotient = 6.81

Example 7 – Divide 3.28 by 0.4

Solution: We can write it as $\frac{3.28}{0.4} = \frac{3.28 \times 10}{0.4 \times 10} = \frac{32.8}{4}$

$$\Rightarrow \frac{3.28}{0.4} = \frac{82}{10} = 8.2$$

Example 8 – Divide 42.8 by 0.02

Solution: We can write it as $\frac{42.8}{0.02} = \frac{428 \times 100}{0.02 \times 100} = \frac{428 \times 10}{2} = \frac{4280}{2}$

$$\Rightarrow \frac{42.8}{0.02} = 2140$$

Example 9 – Divide 0.00942 by 0.314

Solution: We can write it as $\frac{0.00942}{0.314} = \frac{942 \times 1000}{314 \times 100000} = \frac{942}{314 \times 100}$

Firstly, we simply divide 942 by 314 as follows:

$$\begin{array}{r}
 314 \overline{) 942} \quad 3 \\
 \underline{942} \\
 0
 \end{array}$$

Thus, we get $\frac{942}{314} = 3$

$$\Rightarrow \frac{942}{314 \times 100} = \frac{3}{100} = 0.03$$

Therefore, Quotient = 0.03

Example 10 – Divide 0.0216 by 0.6

Solution: We can write it as $\frac{0.0216}{0.6} = \frac{216 \times 10}{6 \times 10000} = \frac{216}{6 \times 1000}$

$$\Rightarrow \frac{0.0216}{0.6} = \frac{36}{1000} = 0.036$$

Example 11 – Divide 0.0024 by 0.04

Solution: We can write it as $\frac{0.0024}{0.04} = \frac{24 \times 100}{4 \times 10000} = \frac{24}{4 \times 100}$

$$\Rightarrow \frac{0.0024}{0.04} = \frac{6}{100} = 0.06$$

Example 12 – Divide 6.9168 by 52.4

Solution: We can write it as $\frac{6.9168}{52.4} = \frac{69168 \times 10}{524 \times 10000} = \frac{69168}{524 \times 1000}$

Firstly, we simply divide 69168 by 524 as follows:

$$\begin{array}{r}
 524 \overline{) 69168} \quad (132 \\
 \underline{524} \\
 1676 \\
 \underline{1572} \\
 1048 \\
 \underline{1048} \\
 0
 \end{array}$$

Thus, we get $\frac{69168}{524} = 132$

$$\Rightarrow \frac{69168}{524 \times 1000} = \frac{132}{1000} = 0.132$$

Therefore, Quotient = 0.132

Example 13 – Divide 1391 by 1.3

Solution: We can write it as $\frac{1391}{1.3} = \frac{1391 \times 10}{13} = \frac{13910}{13}$

We simply divide 13910 by 13 as follows:

$$\begin{array}{r}
 13 \overline{) 13910} \quad (1070 \\
 \underline{13} \\
 091 \\
 \underline{91} \\
 0 \\
 \underline{0} \\
 0 \\
 \underline{0}
 \end{array}$$

Thus, we get $\frac{13910}{13} = 1070$

Therefore, Quotient = 1070

Example 14 – Divide 42 by 16

Solution:

$$\begin{array}{r}
 16 \overline{) 42.000} \quad (2.625 \\
 \underline{32} \\
 100 \\
 \underline{96} \\
 40 \\
 \underline{32} \\
 80 \\
 \underline{80} \\
 0
 \end{array}$$

Therefore, Quotient = 2.625

Example 15 – Divide:

(i) 3 by 8

Solution: We will attach zeros in the dividend in order to divide 3 by 8

$$\begin{array}{r} 8 \overline{) 3.000} \quad 0.375 \\ \underline{0} \\ 30 \\ \underline{24} \\ 60 \\ \underline{56} \\ 40 \\ \underline{40} \\ 0 \end{array}$$

Therefore, Quotient = 0.375

(ii) 3 by 80

Solution: We will attach zeros in the dividend in order to divide 3 by 8

$$\begin{array}{r} 80 \overline{) 3.00000} \quad 0.0375 \\ \underline{0} \\ 30 \\ \underline{00} \\ 300 \\ \underline{240} \\ 600 \\ \underline{560} \\ 400 \\ \underline{400} \\ 0 \end{array}$$

Therefore, Quotient = 0.0375

Example 16 – The cost of 24 pens is Rs 2986.80. Find the cost of one pen.

Solution: It is given that, cost of 24 pens = Rs 2986.80

Thus, cost of 1 pen = Rs (2986.80 ÷ 24)

$$\begin{array}{r} 24 \overline{) 2986.80} \quad 124.45 \\ \underline{24} \\ 58 \\ \underline{48} \\ 106 \\ \underline{96} \\ 108 \\ \underline{96} \\ 120 \\ \underline{120} \\ 0 \end{array}$$

Therefore, cost of 1 pen = 124.45

Example 17 – A car covers a distance of 89.1 km in 2.2 hours. What is the average distance covered by the car in 1 hour?

Solution: It is given that, distance covered by car in 2.2 hours = 89.1 km

Thus, distance covered by car in 1 hour = (89.1 ÷ 2.2) km

We can write it as $\frac{89.1}{2.2} = \frac{891 \times 10}{22 \times 10} = \frac{8910}{220} = \frac{891}{22}$

We simply divide 13910 by 13 as follows:

$$\begin{array}{r} 22 \overline{) 891.0} \quad 40.5 \\ \underline{88} \\ 110 \\ \underline{110} \\ 0 \end{array}$$

Therefore, distance covered by car in 1 hour = 40.5 km

Example 18 – Mrs. Jain bought 14.5 litres of refined oil for Rs 1194.80. Find its cost per litre.

Solution: It is given that, cost of 14.5 litres of refined oil = Rs 1194.80

Thus, cost of 1 litre of petrol = Rs (1194.80 ÷ 14.5)

We can write it as $\frac{1194.80}{14.5} = \frac{119480 \times 10}{145 \times 100} = \frac{119480}{1450} = \frac{11948}{145}$

$$\begin{array}{r} 145 \overline{) 11948.0} \quad 82.4 \\ \underline{1160} \\ 348 \\ \underline{290} \\ 580 \\ \underline{580} \\ 0 \end{array}$$

Therefore, cost of 1 litre of petrol = Rs 82.4

Example 19 – The product of two decimals is 1.8576. If one of the decimals is 0.54, find the other.

Solution: Let the other decimal be 'x'

It is given that, One number = 0.54

Product of two decimals = 1.8576

$$\Rightarrow x \times 0.54 = 1.8576$$

$$\Rightarrow x = 1.8576 \div 0.54$$

We can write it as $\frac{1.8576}{0.54} = \frac{18576 \times 100}{54 \times 10000} = \frac{18576}{5400}$

$$\begin{array}{r}
 5400 \quad) \overline{18576.00} \quad (\quad 3.44 \\
 \underline{16200} \\
 23760 \\
 \underline{21600} \\
 21600 \\
 \underline{26100} \\
 0
 \end{array}$$

Therefore, other number = 3.44

Exercise 3.3

Question 1 – Divide:

(i) 142.45 by 10

Solution: When we divide a decimal by 10, the decimal point is shifted to the left by one place

$$\text{Thus, } \frac{142.45}{10} = 14.245$$

(ii) 54.25 by 10

Solution: When we divide a decimal by 10, the decimal point is shifted to the left by one place

$$\text{Thus, } \frac{54.25}{10} = 5.425$$

(iii) 3.45 by 10

Solution: When we divide a decimal by 10, the decimal point is shifted to the left by one place

$$\text{Thus, } \frac{3.45}{10} = 0.345$$

(iv) 0.57 by 10

Solution: When we divide a decimal by 10, the decimal point is shifted to the left by one place

$$\text{Thus, } \frac{0.57}{10} = 0.057$$

(v) 0.043 by 10

Solution: When we divide a decimal by 10, the decimal point is shifted to the left by one place

$$\text{Thus, } \frac{0.043}{10} = 0.0043$$

(vi) 0.004 by 10

Solution: When we divide a decimal by 10, the decimal point is shifted to the left by one place

$$\text{Thus, } \frac{0.004}{10} = 0.0004$$

Question 2 – Divide:

(i) 459.5 by 100

Solution: When we divide a decimal by 100, the decimal point is shifted to the left by two places

$$\text{Thus, } \frac{459.5}{100} = 4.595$$

(ii) 74.3 by 100

Solution: When we divide a decimal by 100, the decimal point is shifted to the left by two places

$$\text{Thus, } \frac{74.3}{100} = 0.743$$

(iii) 5.8 by 100

Solution: When we divide a decimal by 100, the decimal point is shifted to the left by two places

$$\text{Thus, } \frac{5.8}{100} = 0.058$$

(iv) 0.7 by 100

Solution: When we divide a decimal by 100, the decimal point is shifted to the left by two places

$$\text{Thus, } \frac{0.7}{100} = 0.007$$

(v) 0.48 by 100

Solution: When we divide a decimal by 100, the decimal point is shifted to the left by two places

$$\text{Thus, } \frac{0.48}{100} = 0.0048$$

(vi) 0.03 by 100

Solution: When we divide a decimal by 100, the decimal point is shifted to the left by two places

$$\text{Thus, } \frac{0.03}{100} = 0.0003$$

Question 3 – Divide:

(i) 235.41 by 1000

Solution: When we divide a decimal by 1000, the decimal point is shifted to the left by three places.

$$\text{Thus, } \frac{235.41}{1000} = 0.23541$$

(ii) 29.5 by 1000

Solution: When we divide a decimal by 1000, the decimal point is shifted to the left by three places.

$$\text{Thus, } \frac{29.5}{1000} = 0.0295$$

(iii) 3.8 by 1000

Solution: When we divide a decimal by 1000, the decimal point is shifted to the left by three places.

$$\text{Thus, } \frac{3.8}{1000} = 0.0038$$

(iv) 0.7 by 1000

Solution: When we divide a decimal by 1000, the decimal point is shifted to the left by three places.

$$\text{Thus, } \frac{0.7}{1000} = 0.0007$$

Question 4 – Divide:

(i) 0.45 by 9

Solution: Since Dividend < divisor. Thus, we will proceed as follows:

$$\text{We can write it as } \frac{0.45}{9} = \frac{45}{9 \times 100}$$

Firstly, we simply divide 45 by 9 as follows:

$$\begin{array}{r} 9 \overline{) 45} \quad (5 \\ \underline{45} \\ 0 \end{array}$$

$$\text{Thus, we get } \frac{45}{9} = 5$$

$$\Rightarrow \frac{45}{9 \times 100} = \frac{5}{100} = 0.05$$

(ii) 217.44 by 18

Solution:

$$\begin{array}{r} 18 \overline{) 217.44} \quad (12.08 \\ \underline{18} \\ 37 \\ \underline{36} \\ 144 \\ \underline{144} \\ 0 \end{array}$$

Therefore, Quotient = 12.08

(iii) 319.2 by 2.28

Solution: We can write it as $\frac{319.2}{2.28} = \frac{3192 \times 100}{228 \times 10} = \frac{319200}{2280} = \frac{31920}{228}$

We simply divide 31920 by 228 as follows:

$$\begin{array}{r} 228 \overline{) 31920} \quad (140 \\ \underline{228} \\ 912 \\ \underline{912} \\ 0 \end{array}$$

Thus, we get $\frac{31920}{228} = 140$

Therefore, Quotient = 140

(iv) 40.32 by 9.6

Solution: We can write it as $\frac{40.32}{9.6} = \frac{4032 \times 10}{96 \times 100} = \frac{40320}{9600} = \frac{4032}{960}$

We simply divide 4032 by 960 as follows:

$$\begin{array}{r} 960 \overline{) 4032.0} \quad (4.2 \\ \underline{3840} \\ 1920 \\ \underline{1920} \\ 0 \end{array}$$

Thus, we get $\frac{4032}{960} = 4.2$

Therefore, Quotient = 4.2

(v) 0.765 by 0.9

Solution: We can write it as $\frac{0.765}{0.9} = \frac{765 \times 10}{9 \times 1000} = \frac{7650}{9000} = \frac{765}{900}$

We simply divide 765 by 9 as follows:

$$\begin{array}{r} 9 \overline{) 765} \quad (85 \\ \underline{72} \\ 45 \\ \underline{45} \\ 0 \end{array}$$

Thus, we get $\frac{765}{9} = 85$

$$\Rightarrow \frac{765}{900} = \frac{85}{100} = 0.85$$

Therefore, Quotient = 0.85

(vi) 0.768 by 1.6

Solution: We can write it as $\frac{0.768}{1.6} = \frac{768 \times 10}{16 \times 1000} = \frac{7680}{16000} = \frac{768}{1600}$

We simply divide 768 by 16 as follows:

$$\begin{array}{r} 16 \overline{) 768} \quad (48 \\ \underline{64} \\ 128 \\ \underline{128} \\ 0 \end{array}$$

Thus, we get $\frac{768}{16} = 48$

$$\Rightarrow \frac{768}{1600} = \frac{48}{100} = 0.48$$

Therefore, Quotient = 0.48

Question 5 – Divide:

(i) 16.64 by 20

Solution: We can write it as $\frac{16.64}{20} = \frac{1664}{20 \times 100} = \frac{1664}{2000}$

We simply divide 1664 by 2 as follows:

$$\begin{array}{r} 2 \overline{) 1664} \quad (832 \\ \underline{16} \\ 06 \\ \underline{6} \\ 04 \\ \underline{04} \\ 0 \end{array}$$

Thus, we get $\frac{1664}{2} = 832$

$$\Rightarrow \frac{1664}{2000} = \frac{832}{1000} = 0.832$$

Therefore, Quotient = 0.832

(ii) 0.192 by 12

Solution: We can write it as $\frac{0.192}{12} = \frac{192}{12 \times 1000}$

We simply divide 192 by 12 as follows:

$$\begin{array}{r} 12 \overline{) 192} \quad (16 \\ \underline{12} \\ 72 \\ \underline{72} \\ 0 \end{array}$$

Thus, we get $\frac{192}{12} = 16$

$$\Rightarrow \frac{192}{12 \times 1000} = \frac{16}{1000} = 0.016$$

Therefore, Quotient = 0.016

(iii) 163.44 by 24

Solution: We can write it as $\frac{163.44}{24} = \frac{16344}{24 \times 100}$

We simply divide 16344 by 24 as follows:

$$\begin{array}{r} 24 \overline{) 16344} \quad (681 \\ \underline{144} \\ 194 \\ \underline{192} \\ 24 \\ \underline{24} \\ 0 \end{array}$$

Thus, we get $\frac{16344}{24} = 681$

$$\Rightarrow \frac{16344}{24 \times 100} = \frac{681}{100} = 6.81$$

Therefore, Quotient = 6.81

(iv) 403.2 by 96

Solution: We can write it as $\frac{403.2}{96} = \frac{4032}{96 \times 10} = \frac{4032}{960}$

We simply divide 4032 by 960 as follows:

$$\begin{array}{r} 960 \overline{) 4032.0} \quad (4.2 \\ \underline{3840} \\ 1920 \\ \underline{1920} \\ 0 \end{array}$$

Thus, we get $\frac{4032}{960} = 4.2$

Therefore, Quotient = 4.2

(v) 16.344 by 12

Solution: We can write it as $\frac{16.344}{12} = \frac{16344}{12 \times 1000}$

We simply divide 16344 by 12 as follows:

$$\begin{array}{r} 12 \overline{) 16344} \quad (1362 \\ \underline{12} \\ 43 \\ \underline{36} \\ 74 \\ \underline{72} \\ 24 \\ \underline{24} \\ 0 \end{array}$$

Thus, we get $\frac{16344}{12} = 1362$

$$\Rightarrow \frac{16344}{12 \times 1000} = \frac{1362}{1000} = 1.362$$

Therefore, Quotient = 1.362

(vi) 31.92 by 228

Solution: We can write it as $\frac{31.92}{228} = \frac{3192}{228 \times 100}$

We simply divide 3192 by 228 as follows:

$$\begin{array}{r} 228 \overline{) 3192} \quad (14 \\ \underline{228} \\ 912 \\ \underline{912} \\ 0 \end{array}$$

Thus, we get $\frac{3192}{228} = 14$

$$\Rightarrow \frac{3192}{228 \times 100} = \frac{14}{100} = 0.14$$

Therefore, Quotient = 0.14

Question 6 – Divide:

(i) 15.68 by 20

Solution: We can write it as $\frac{15.68}{20} = \frac{1568}{20 \times 100}$

We simply divide 1568 by 20 as follows:

$$\begin{array}{r} 20 \overline{) 1568.0} \quad (78.4 \\ \underline{140} \\ 168 \\ \underline{160} \\ 80 \\ \underline{80} \\ 0 \end{array}$$

Thus, we get $\frac{1568}{20} = 78.4$

$$\Rightarrow \frac{1568}{20 \times 100} = \frac{78.4}{100} = 0.784$$

Therefore, Quotient = 0.784

(ii) 164.6 by 200

Solution: We can write it as $\frac{164.6}{200} = \frac{1646}{200 \times 10}$

We simply divide 1646 by 200 as follows:

$$\begin{array}{r} 200 \overline{) 1646.00} \quad (8.23 \\ \underline{1600} \\ 460 \\ \underline{400} \\ 600 \\ \underline{600} \\ 0 \end{array}$$

Thus, we get $\frac{1646}{200} = 8.23$

$$\Rightarrow \frac{1646}{200 \times 10} = \frac{8.23}{10} = 0.823$$

Therefore, Quotient = 0.823

(iii) 403.80 by 30

Solution: We can write it as $\frac{403.80}{30} = \frac{40380}{30 \times 100} = \frac{40380}{3000} = \frac{4038}{300}$

We simply divide 4038 by 300 as follows:

$$\begin{array}{r} 300 \overline{) 4038.0} \quad (13.46 \\ \underline{300} \\ 1038 \\ \underline{900} \\ 1380 \\ \underline{1200} \\ 1800 \\ \underline{1800} \\ 0 \end{array}$$

Thus, we get $\frac{4038}{300} = 13.46$

Therefore, Quotient = 13.46

Question 7 – Divide:

(i) 76 by 0.019

Solution: Firstly, we convert the denominator into whole number as follows:

$$\Rightarrow \frac{76}{0.019} = \frac{76 \times 1000}{19}$$

We simply divide 76 by 19 as follows:

$$\begin{array}{r} 19 \overline{) 76} \quad (4 \\ \underline{76} \\ 0 \end{array}$$

Thus, we get $\frac{76}{19} = 4$

$$\Rightarrow \frac{76 \times 1000}{19} = 4 \times 1000 = 4000$$

Therefore, Quotient = 4000

(ii) 88 by 0.08

Solution: Firstly, we convert the denominator into whole number as follows:

$$\Rightarrow \frac{88}{0.08} = \frac{88 \times 100}{8}$$

We simply divide 88 by 8 as follows:

$$\begin{array}{r} 8 \quad) \quad 88 \quad (\quad 11 \\ \underline{88} \\ 0 \end{array}$$

Thus, we get $\frac{88}{8} = 11$

$$\Rightarrow \frac{88 \times 100}{8} = 11 \times 100 = 1100$$

Therefore, Quotient = 1100

(iii) 148 by 0.074

Solution: Firstly, we convert the denominator into whole number as follows:

$$\Rightarrow \frac{148}{0.074} = \frac{148 \times 1000}{74}$$

We simply divide 148 by 74 as follows:

$$\begin{array}{r} 74 \quad) \quad 148 \quad (\quad 2 \\ \underline{148} \\ 0 \end{array}$$

Thus, we get $\frac{148}{74} = 2$

$$\Rightarrow \frac{148 \times 1000}{74} = 2 \times 1000 = 2000$$

Therefore, Quotient = 2000

(iv) 7 by 0.014

Solution: Firstly, we convert the denominator into whole number as follows:

$$\Rightarrow \frac{7}{0.014} = \frac{7 \times 1000}{14} = \frac{70 \times 100}{14}$$

We simply divide 70 by 14 as follows:

$$\begin{array}{r} 14 \quad \overline{) 70} \quad (5 \\ \underline{70} \\ 0 \end{array}$$

Thus, we get $\frac{70}{14} = 5$

$$\Rightarrow \frac{70 \times 100}{14} = 5 \times 100 = 500$$

Therefore, Quotient = 500

Question 8 – Divide:

(i) 20 by 50

Solution: We can write it as $\frac{20}{50} = \frac{2}{5}$

Now, we will simply divide 2 by 5 by adding zeros to 2

$$\begin{array}{r} 5 \quad \overline{) 2.0} \quad (0.4 \\ \underline{20} \\ 0 \end{array}$$

Thus, we get $\frac{2}{5} = 0.4$

Therefore, Quotient = 0.4

(ii) 8 by 100

Solution: When we divide a decimal by 100, the decimal point is shifted to the left by two places

$$\text{Thus, } \frac{8}{100} = 0.08$$

(iii) 72 by 576

Solution: We simply divide 72 by 576 as follows:

$$\begin{array}{r} 576 \overline{) 72.000} \quad 0.125 \\ \underline{576} \\ 1440 \\ \underline{1152} \\ 2880 \\ \underline{2880} \\ 0 \end{array}$$

Thus, we get $\frac{72}{576} = 0.125$

Therefore, Quotient = 0.125

(iv) 144 by 15

Solution: We simply divide 144 by 15 as follows:

$$\begin{array}{r} 15 \overline{) 144.0} \quad 9.6 \\ \underline{135} \\ 90 \\ \underline{90} \\ 0 \end{array}$$

Thus, we get $\frac{144}{15} = 9.6$

Therefore, Quotient = 9.6

Question 9 – A vehicle covers a distance of 43.2 km in 2.4 litres of petrol. How much distance will it travel in 1 litre of petrol?

Solution: It is given that, distance covered in 2.4 litres of petrol = 43.2 km

Thus, distance covered in 1 litre of petrol = $(43.2 \div 2.4)$ km

We can write it as $\frac{43.2}{2.4} = \frac{432 \times 10}{24 \times 10} = \frac{4320}{240} = \frac{432}{24}$

We simply divide 432 by 24 as follows:

$$\begin{array}{r} 24 \overline{) 432} \quad (18 \\ \underline{24} \\ 192 \\ \underline{192} \\ 0 \end{array}$$

Therefore, distance covered in 1 litre petrol = 18 km

Question 10 – The total weight of some bags of wheat is 1743 g. If each bag weights 49.8 kg, how many bags are there?

Solution: It is given that, total weight of some bags of wheat = 1743 kg

Weight of each bag = 49.8 kg

Thus, number of bags = total weight of bags ÷ weight of 1 bag

= (1743 ÷ 49.8) kg

We can write it as $\frac{1743}{49.8} = \frac{1743 \times 10}{498} = \frac{17430}{498}$

We simply divide 17430 by 498 as follows:

$$\begin{array}{r} 498 \overline{) 17430} \quad (35 \\ \underline{1494} \\ 2490 \\ \underline{2490} \\ 0 \end{array}$$

Therefore, number of bags = 35

Question 11 – Shikha cuts 50 m of cloth into pieces of 1.25 m each? How many pieces does she get?

Solution: It is given that, total length of cloth = 50 m

Length of each piece of cloth = 1.25 m

Thus, number of pieces of cloth = Total length \div length of each piece

$$= 50 \div 1.25$$

We can write it as $\frac{50}{1.25} = \frac{50 \times 100}{125} = \frac{5000}{125}$

We simply divide 5000 by 125 as follows:

$$\begin{array}{r} 125 \quad) \quad \overline{5000} \quad (\quad 40 \\ \underline{500} \\ 0 \\ 0 \\ \underline{0} \\ 0 \end{array}$$

Therefore, number of bags = 40

Question 12 – Each side of a rectangular polygon is 2.5 cm in length. The perimeter of the polygon is 12.5 cm. How many sides does the polygon have?

Solution: It is given that, length of each side of rectangular polygon = 2.5 cm

Perimeter of polygon = 12.5 cm

We know that, perimeter of polygon = sum of all its sides

Let us suppose that number of sides be 'n'

Thus, perimeter = $n \times$ length of each side

$$\Rightarrow 12.5 = n \times 2.5$$

$$\Rightarrow n = \frac{12.5}{2.5} = \frac{125}{25}$$

We simply divide 125 by 25 as follows:

$$\begin{array}{r} 25 \quad) \quad \overline{125} \quad (\quad 5 \\ \underline{125} \\ 0 \end{array}$$

Therefore, number of sides (n) = 5

Question 13 – The product of two decimals is 42.987. If one of them is 12.46, find the other.

Solution: Let the other decimal be 'x'

It is given that, One number = 12.46

Product of two decimals = 42.987

$$\Rightarrow x \times 12.46 = 42.987$$

$$\Rightarrow x = 42.987 \div 12.46$$

We can write it as $\frac{42.987}{12.46} = \frac{42987 \times 100}{1246 \times 1000} = \frac{42987}{12460}$

$$\begin{array}{r} 12460 \quad) \overline{42987.00} \quad (3.45 \\ \underline{37380} \\ 56070 \\ \underline{49840} \\ 62300 \\ \underline{62300} \\ 0 \end{array}$$

Therefore, other number = 3.45

Question 14 – The weight of 34 bags of sugar is 3483.3 kg. If all bags weigh equality, find the weight of each bag.

Solution: It is given that, weight of 34 bags of sugar = 3483.3 kg

Then, weight of 1 bag = (3483.3 ÷ 34)

We can write it as $\frac{3483.3}{34} = \frac{34833}{340}$

We simply divide 34833 by 340 as follows:

$$\begin{array}{r}
 340 \overline{) 34833.0} \quad (102.45 \\
 \underline{340} \\
 833 \\
 \underline{680} \\
 1530 \\
 \underline{1360} \\
 1700 \\
 \underline{1700} \\
 0
 \end{array}$$

Therefore, weight of 1 bag = 102.45 kg

Question 15 – How many buckets of equal capacity can be filled from 586.5 litres of water, if each bucket has capacity of 8.5 litres?

Solution: It is given that, total capacity of all buckets = 586.5 litres

Capacity of 1 bucket = 8.5 litres

Thus, number of buckets = Total capacity ÷ capacity of 1 bucket

$$= 586.5 \div 8.5$$

We can write it as $\frac{586.5}{8.5} = \frac{5865}{85}$

We simply divide 5865 by 85 as follows:

$$\begin{array}{r}
 85 \overline{) 5865} \quad (69 \\
 \underline{510} \\
 765 \\
 \underline{765} \\
 0
 \end{array}$$

Therefore, number of buckets = 69

Objective Type Questions

Question 1 – When 0.48 is written in the simplest form of its terms, the sum of its numerator and denominator is?

Solution: In the simplest form, $0.48 = \frac{48}{100} = \frac{24}{50} = \frac{12}{25}$

Thus, sum of numerator and denominator = $12 + 25 = 37$

Question 2 – The improper fraction $2\frac{1}{25}$ in decimal form is?

Solution: We have, $2\frac{1}{25} = \frac{(2 \times 25) + 1}{25} = \frac{50 + 1}{25} = \frac{51}{25}$

We simply divide 51 by 25 as follows:

$$\begin{array}{r} 25 \quad) \quad \overline{51.00} \quad (\quad 2.04 \\ \underline{50} \\ 100 \\ \underline{100} \\ 0 \end{array}$$

Thus, quotient is 2.04

Therefore, improper fraction of $2\frac{1}{25}$ is 2.04

Question 3 – $4 + 4.4 + 44.4 + 4.04 + 444 = ?$

Solution: Firstly, we will convert the decimals into like decimals as follows:

$$\begin{aligned} &4.00 + 4.40 + 44.40 + 4.04 + 444.00 \\ &= 500.84 \end{aligned}$$

Question 4 – 1.04 as an mixed fraction is?

Solution: We can write 1.04 as $\frac{104}{100}$

We will divide 104 by 100 as follows:

$$\begin{array}{r}
 100 \overline{) 104} \quad (1 \\
 \underline{100} \\
 4
 \end{array}$$

Thus, $1.04 = 1 \frac{4}{100} = 1 \frac{1}{25}$

Question 5 – If $24.125 = 24 + \frac{A}{10} + \frac{B}{100} + \frac{C}{1000}$, then $A + B + C = ?$

Solution: $24.125 - 24 = \frac{A}{10} + \frac{B}{100} + \frac{C}{1000}$

$$\Rightarrow 0.125 = \frac{A}{10} + \frac{B}{100} + \frac{C}{1000}$$

$$\Rightarrow \frac{125}{1000} = \frac{A}{10} + \frac{B}{100} + \frac{C}{1000}$$

$$\Rightarrow \frac{125}{1000} = \frac{100A + 10B + C}{1000}$$

$$\Rightarrow 100A + 10B + C = 125$$

It is only possible when $A = 1$, $B = 2$ and $C = 5$

$$\text{Thus, } A + B + C = 1 + 2 + 5 = 8$$

Question 6 – $0.002 \times 0.5 = ?$

Solution: Here, a decimal is multiplied by another decimal. Thus, we multiply both decimals without decimal point and then we insert the decimal point as per the given decimal places.

So, first we simply solve 2×5 which is 10

Now, 0.002×0.5 has total of 4 decimal places.

Thus, we put decimal point in the product by counting four places from right to left.

$$\text{Therefore, } 0.002 \times 0.5 = 0.0010$$

Question 7 – $3 \times 0.3 \times 0.03 \times 0.003 \times 30 = ?$

Solution: Here, a decimal is multiplied by another decimal. Thus, we multiply all decimals without decimal point and then we insert the decimal point as per the given decimal places.

So, first we simply solve $3 \times 3 \times 3 \times 3 \times 30$ which is 2430

Now, $3 \times 0.3 \times 0.03 \times 0.003 \times 30$ has total of 6 decimal places.

Thus, we put decimal point in the product by counting six places from right to left.

Therefore, $3 \times 0.3 \times 0.03 \times 0.003 \times 30 = 0.002430$

Question 8 – $0.012 \times 0.15 = ?$

Solution: Here, a decimal is multiplied by another decimal. Thus, we multiply both decimals without decimal point and then we insert the decimal point as per the given decimal places.

So, first we simply solve 12×15 which is 180

Now, 0.012×0.15 has total of 5 decimal places.

Thus, we put decimal point in the product by counting five places from right to left.

Therefore, $0.012 \times 0.15 = 0.00180$

Question 9 – $75.57 \div 0.01 = ?$

Solution: We can write it as $\frac{75.57}{0.01} = \frac{7557 \times 100}{1 \times 100} = 4557$

Question 10 – What should be subtracted from 0.1 to get 0.06?

Solution: Let the required number be 'x'

Then, $0.1 - x = 0.06$

$\Rightarrow x = 0.1 - 0.06$

We will convert them into like decimals = $0.10 - 0.06$

$$\begin{array}{r} 0.10 \\ - 0.06 \\ \hline 0.04 \end{array}$$

Therefore, the required number is 0.04

Question 11 – What should be added to 5.09 to get 5.5?

Solution: Let the required number be 'x'

$$\text{Then, } 5.09 + x = 5.5$$

$$\Rightarrow x = 5.5 - 5.09$$

Now, we will convert these decimals into like decimals as follows:

$$\Rightarrow x = 5.50 - 5.09$$

$$\Rightarrow x = 0.41$$

Question 12 – $0.3 \times 0.3 \times 0.3 = ?$

Solution: Here, a decimal is multiplied by another decimal. Thus, we multiply all decimals without decimal point and then we insert the decimal point as per the given decimal places.

So, first we simply solve $3 \times 3 \times 3$ which is 27

Now, $0.3 \times 0.3 \times 0.3$ has total of 3 decimal places.

Thus, we put decimal point in the product by counting three places from right to left.

$$\text{Therefore, } 0.3 \times 0.3 \times 0.3 = 0.027$$

Question 13 – $0.25 \times 0.8 = ?$

Solution: Here, a decimal is multiplied by another decimal. Thus, we multiply both decimals without decimal point and then we insert the decimal point as per the given decimal places.

So, first we simply solve 25×8 which is 200

Now, 0.25×0.8 has total of 3 decimal places.

Thus, we put decimal point in the product by counting three places from right to left.

$$\text{Therefore, } 0.25 \times 0.8 = 0.200 = 0.2$$

Question 14 – 5 kg 5 g written in decimal notation is?

Solution: Since 1 kg = 1000 g

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

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

$$\text{Thus, we can write it as: } 5kg \ 5g = 5 + \frac{5}{1000} = 5 + 0.005 = 5.005kg$$

Question 15 – 0.012 ÷ 1.5 =?

$$\text{Solution: We can write it as } \frac{0.012}{1.5} = \frac{12 \times 10}{15 \times 1000} = \frac{120}{15000} = \frac{12}{1500} = \frac{12}{15 \times 100}$$

We simply divide 12 by 15 as follows:

$$\begin{array}{r} 15 \quad \overline{) \quad 12.0} \quad (\quad 0.8 \\ \underline{120} \\ 0 \end{array}$$

$$\text{Thus, we get } \frac{12}{15} = 0.8$$

$$\Rightarrow \frac{12}{15 \times 100} = \frac{0.8}{100} = 0.008$$

Therefore, Quotient = 0.008

Question 16 – 0.02 × 0.05 =?

Solution: Here, a decimal is multiplied by another decimal. Thus, we multiply both decimals without decimal point and then we insert the decimal point as per the given decimal places.

So, first we simply solve 2×5 which is 10

Now, 0.02×0.05 has total of 4 decimal places.

Thus, we put decimal point in the product by counting four places from right to left.

$$\text{Therefore, } 0.02 \times 0.05 = 0.0010 = 0.001$$

Question 17 – 5 km 5 m =?

Solution: Since 1 km = 1000 m

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

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

Thus, we can write it as: $5 \text{ km } 5 \text{ m} = 5 + \frac{5}{1000} = 5 + 0.005 = 5.005 \text{ km}$

Question 18 – The value of $2.2 \times 0.2 \times 0.001$ is?

Solution: Here, a decimal is multiplied by another decimal. Thus, we multiply all decimals without decimal point and then we insert the decimal point as per the given decimal places.

So, first we simply solve $22 \times 2 \times 1$ which is 44

Now, $2.2 \times 0.2 \times 0.001$ has total of 5 decimal places.

Thus, we put decimal point in the product by counting five places from right to left.

Therefore, $2.2 \times 0.2 \times 0.001 = 0.00044$

Question 19 – If $14 \times 4 = 56$, then $0.014 \times 4 = ?$

Solution: Since 0.014×4 has total of 3 decimal places. Thus, we put decimal point in the product $14 \times 4 = 56$ by counting three places from right to left.

Therefore, $0.014 \times 4 = 0.056$

Question 20 – 8 ml is equal to?

Solution: Since 1 litre = 1000 mL

$$\Rightarrow 1000 \text{ mL} = 1 \text{ L}$$

$$\Rightarrow 1 \text{ mL} = \frac{1}{1000} \text{ L}$$

Therefore, $8 \text{ mL} = \frac{8}{1000} \text{ L} = 0.008 \text{ L}$