

1. Convert $233/100$ into decimal.

Ans.

$$\begin{array}{r} 2.33 \\ 100 \overline{) 233} \\ \underline{- 200} \\ 330 \\ \underline{- 300} \\ 300 \\ \underline{- 300} \\ 0 \end{array}$$

2. Express each of the following as decimals.

(i) $\frac{15}{2}$ (ii) $\frac{19}{25}$ (iii) $\frac{7}{50}$

Ans.

$$(i) \frac{15}{2} = \frac{15 \times 5}{2 \times 5} = \frac{75}{10} = 7.5$$

(Making the denominator 10 or higher power of 10)

$$(ii) \frac{19}{25} = \frac{19 \times 4}{25 \times 4} = \frac{76}{100} = 0.76.$$

$$(iii) \frac{7}{50} = \frac{7 \times 2}{50 \times 2} = \frac{14}{100} = 0.14$$

3. Convert each of the following into fractions.

(i) 3.91 (ii) 2.017

Ans. (i) 3.91

Write the given decimal number without the decimal point as numerator.

In the denominator, write 1 followed by two zeros as there are 2 digits in the decimal part of the decimal number.

$$= \frac{391}{100}$$

(ii) 2.017

$$= \frac{2.017}{1}$$

$= 2.017 \times \frac{1000}{1} \times 1000 \rightarrow$ In the denominator, write 1 followed by three zeros as there are 3 digits in the decimal part of the decimal number.

$$= \frac{2017}{1000}$$

4. Convert the decimal numbers 5.42, 11.6 and 212.075 into like decimals.

Ans. We observe that in the given decimals 5.42, 11.6 and 212.075; the maximum number of decimal places is three.

The decimal 212.075 has the maximum number of decimal places, i.e., 3. So, we convert each of the other decimal numbers into the one having three places of decimal.

So, 5.42 is written as 5.420,

11.6 is written as 11.600

212.075 is already having three decimal places.

Therefore, 5.420, 11.600 and 212.075 are expressed as like decimals.

5. Write the decimal and fractional expansion of 284.361.

Ans.

Hundreds	Tens	Ones	.	tenths	hundredths	thousandths
2	8	4	DECIMAL POINT	3	6	1

In decimal expansion:

$$2 \times 100 + 8 \times 10 + 4 \times 1 + 3 \times \frac{1}{10} + 6 \times \frac{1}{100} + 1 \times \frac{1}{1000}$$

$$200 + 80 + 4 + \frac{3}{10} + \frac{6}{100} + \frac{1}{1000}$$

$$200 + 80 + 4 + 0.3 + 0.06 + 0.001$$

In fractional expansion:

$$2 \times 100 + 8 \times 10 + 4 \times 1 + 3 \times \frac{1}{10} + 6 \times \frac{1}{100} + 1 \times \frac{1}{1000}$$

$$200 + 80 + 4 + \frac{3}{10} + \frac{6}{100} + \frac{1}{1000}$$

6. Add the decimals:

(i) 1.83, 21.105, 236.8 and 0.9

(ii) 7.39, 65.007, 213.8 and 91.2

Ans. (i) 1.83, 21.105, 236.8 and 0.9

We have $1.83 + 21.105 + 236.8 + 0.9$

Converting all the addends to like decimals

$1.830 + 21.105 + 236.800 + 0.900$

Arranging the addends in columns and on adding we get 260.635.

$$\begin{array}{r} \textcircled{1}\textcircled{2} \longrightarrow \text{Carry addition as usual} \\ 1.830 \\ 21.105 \\ 236.800 \\ + 0.900 \\ \hline 260.635 \end{array}$$

↓
Line up the decimal points

(ii) 7.39, 65.007, 213.8 and 91.2

We have $7.39 + 65.007 + 213.8 + 91.2$

Converting all the addends to like decimals

$7.390 + 65.007 + 213.800 + 91.200$

Arranging the addends in columns and on adding we get 377.397.

$$\begin{array}{r} \textcircled{1}\textcircled{1}\textcircled{1} \longrightarrow \text{Carry addition as usual} \\ 7.390 \\ 65.007 \\ 213.800 \\ + 91.200 \\ \hline 377.397 \end{array}$$

↓
Line up the decimal points

7. Subtract the decimals:

(i) 27.59 from 31.4

(ii) 243.86 from 402.1

Ans. (i) 27.59 from 31.4

We have 27.59 from 31.4

Converting both the decimal numbers into like decimals,

$$31.40 - 27.59$$

Now arrange them in columns and subtract we get 3.81

$$\begin{array}{r} \overset{2}{3} \overset{10}{1} \overset{13}{1} \overset{10}{0} \longrightarrow \text{Borrow as usual} \\ 31.40 \\ - 27.59 \\ \hline 3.81 \end{array}$$



Line up the decimal points

(ii) 243.86 from 402.1

We have 243.86 from 402.1

Converting both the decimal numbers into like decimals,

$$402.10 - 243.86$$

Now arrange them in columns and subtract we get 158.24

$$\begin{array}{r} \overset{3}{4} \overset{9}{0} \overset{11}{2} \overset{10}{1} \overset{10}{0} \longrightarrow \text{Borrow as usual} \\ 402.10 \\ - 243.86 \\ \hline 158.24 \end{array}$$



Line up the decimal points

8. Simplify the following.

(a) $25.20 + 94.38 - 45.99$ (b) $11.6078 - 0.67 + 0.5$

Ans. Converting into like decimals and solving by using order of operation.

(a) $25.20 + 94.38 - 45.99$

Step I: Addition

$$25.20 + 94.38$$

Simplify Decimals

$$\begin{array}{r} 25.20 \\ + 94.38 \\ \hline 119.58 \end{array}$$

$$= 119.58$$

Step II: Subtraction

$$119.58 - 45.99 = 73.59$$

$$\begin{array}{r} \overset{11}{1} \overset{8}{9} \overset{14}{5} \overset{18}{8} \\ 119.58 \\ - 45.99 \\ \hline 73.59 \end{array}$$

(b) $11.6078 - 0.67 + 0.5$

Converting into like decimals and solving, we get

$$11.6078 - 0.6700 + 0.5000$$

Step I: Subtraction

$$\begin{array}{r} \overset{15}{11} \overset{10}{6} \overset{0}{7} \overset{8}{8} \\ 11.6078 \\ - 0.6700 \\ \hline 10.9378 \end{array}$$

$$11.6078 - 0.6700 = 10.9378$$

Step II: Addition

$$10.9378 + 0.5000 = 11.4378$$

$$\begin{array}{r} 10.9378 \\ + 0.5000 \\ \hline 11.4378 \end{array}$$

9. Find the product:

(i) 5.36×8 (ii) 11.71×12

Ans. (i) 5.36×8

$$= 536 \times 8 \text{ (Find the product without the decimal point)}$$

$$\begin{array}{r} 24 \\ 536 \\ \times 8 \\ \hline 4288 \end{array}$$

$$= 4288$$

Since, 5.36 has two decimal places.

Therefore, 5.36×8 will also have two decimal places.

$$\text{Therefore, } 5.36 \times 8 = 42.88$$

(ii) 11.71×12

$$\begin{array}{r}
 1171 \\
 \times 12 \\
 \hline
 2342 \\
 + 11710 \\
 \hline
 14052
 \end{array}$$

= 1171×12 (Find the product without the decimal point)
 = 14052

Since, 140.52 has two decimal places.

Therefore, 11.71×12 will also have two decimal places.

Therefore, $11.71 \times 12 = 140.52$

10. The length and breadth of a rectangle are 8.15 m and 3.36 m. Find the area of the rectangle.

Ans. Length of the rectangle = 8.15 m

Breadth of the rectangle = 3.36 m

Area of the rectangle = $(8.15 \times 3.36)\text{m}^2 = 27.384 \text{m}^2$.

11. Multiply:

(i) 73.47 by 0.63 (ii) 590.3 by 17.8

Ans. (i) 73.47 by 0.63

73.47×0.63

Multiply the two decimal numbers without the decimal point.

$7347 \times 63 = 462861$

$$\begin{array}{r}
 224 \leftarrow \\
 112 \leftarrow \\
 7347 \\
 \times 63 \\
 \hline
 22041 \\
 + 440820 \\
 \hline
 462861
 \end{array}$$

The sum of the decimal places of the two decimal numbers is $2 + 2 = 4$

So, the product of two decimal numbers will have 4 decimal places

Therefore, $73.47 \times 0.63 = 46.2861$

(ii) 590.3 by 17.8

$$590.3 \times 17.8$$

Multiply the two decimal numbers without the decimal point.

$$5903 \times 178$$

$$= 1050734$$

$$\begin{array}{r} 5903 \\ \times 178 \\ \hline 47224 \\ 413210 \\ + 590300 \\ \hline 1050734 \end{array}$$

The sum of the decimal places of the two decimal numbers is $1 + 1 = 2$

So, the product of two decimal numbers will have 2 decimal places

Therefore, $590.3 \times 17.8 = 10507.34$.

12. Find the quotient:

(i) 0.2080 by 65 .

(ii) 0.625 by 25

Ans. (i) $0.2080 \div 65$

Divide the decimal number without the decimal point.

$$\begin{array}{r} 32 \\ 65 \overline{) 2080} \\ \underline{- 195} \\ 130 \\ \underline{- 130} \\ 0 \end{array}$$

So we have,

Since, 0.2080 has 4 decimal places

Therefore, $0.2080 \div 65$ will also have 4 decimal places

Therefore, $0.2080 \div 65 = 0.0032$

(ii) 0.625 by 25

$$0.625 \div 25$$

Divide the decimal number without the decimal point.

$$\begin{array}{r} 25 \\ 25 \overline{)625} \\ \underline{-50} \\ 125 \\ \underline{-125} \\ 0 \end{array}$$

So we have,

Since, 0.625 has 3 decimal places

Therefore, $0.625 \div 25$ will also have 3 decimal places

Therefore, $0.625 \div 25 = 0.025$

13. A car travels 234.40 km in 4 hours. How much distance will it travel in 1 hour?

Ans. Number of hours = 4

Distance covered by a car in 4 hours = 234.40 km

Therefore, a car can travel 1 hour = $(234.40 \div 4)$ km = 58.6 km

14. Find the quotient of:

(i) Divide 96.075 by 6.3

(ii) Divide 24.629 by 1.1

Ans. (i) Divide 96.075 by 6.3

Since, the divisor has 1 decimal place.

Therefore, multiply the dividend and divisor by 10

$$\text{i.e., } \frac{96.075 \times 10}{6.3 \times 10} = \frac{960.75}{63}$$

Now, divide 960.75 by 63

i.e., $960.75 \div 63$

Divide the decimal number without the decimal point,

so we have $96075 \div 63$

$$\begin{array}{r} 1525 \\ 63 \overline{)96075} \\ \underline{-63} \\ 330 \\ \underline{-315} \\ 157 \\ \underline{-126} \\ 315 \\ \underline{-315} \\ 0 \end{array}$$

Since, 960.75 has 2 decimal places

Therefore, $960.75 \div 63$ will also have 2 decimal places

Therefore, $960.75 \div 63 = 15.25$

(ii) Divide 24.629 by 1.1

Since, the divisor has 1 decimal place.

Therefore, multiply the dividend and divisor by 10

$$\text{i. e., } \frac{24.629 \times 10}{1.1 \times 10} = \frac{246.29}{11}$$

Now, divide 246.29 by 11

i.e., $246.29 \div 11$

Divide the decimal number without the decimal point,

so we have $24629 \div 11$

$$\begin{array}{r} 2239 \\ 11 \overline{) 24629} \\ \underline{- 22} \\ 26 \\ \underline{- 22} \\ 42 \\ \underline{- 33} \\ 99 \\ \underline{- 99} \\ 0 \end{array}$$

Since, 246.29 has 2 decimal places

Therefore, $246.29 \div 11$ will also have 2 decimal places

Therefore, $960.75 \div 63 = 22.39$.

15. Round off the following decimals.

(a) 52.6583 correct up to 2 places of decimal.

(b) 103.06 correct up to 1 place of decimal.

(c) 189.0072 correct up to 3 places of decimal.

Ans. (a) 52.6583 correct up to 2 places of decimal.

52.6583 Rounding off 52.6583 correct up to 2 places of decimal means rounding off to the nearest hundredths

In 52.6583 we observe the digit at the thousandths place value and round off 52.6583 correct up to 2 places of decimal.

The digit at the thousandths place is 8 and $8 > 5$.

The digit at the hundredths place increases by 1 and the digit at the thousandths place becomes 0.

Therefore, 52.6583 is rounded off as 52.66

(b) 103.06 correct up to 1 place of decimal.

103.06

Rounding off 103.06 correct up to 1 places of decimal means rounding off to the nearest tenths

In 103.06 we observe the digit at the hundredths place value and round off 103.06 correct up to 1 place of decimal.

The digit at the hundredths place is 6 and $6 > 5$.

The digit at the tenths place increases by 1 and the digit at the hundredths place becomes 0.

Therefore, 103.06 is rounded off as 103.1

(c) 189.0072 correct up to 3 places of decimal.

189.0072

Rounding off 189.0072 correct up to 3 places of decimal means rounding off to the nearest thousandths

In 189.0072 we observe the digit at the ten thousandths place value and round off 189.0072 correct up to 3 places of decimal.

The digit at the ten thousandths place is 2 and $2 < 5$.

The digit at the thousandths place remains unchanged and the digit at the ten thousandths place becomes 0 (rounded down).

Therefore, 189.0072 is rounded off as 189.007.

16. Find the H.C.F. and the L.C.M. of 1.20 and 22.5

Ans. Given, 1.20 and 22.5

Converting each of the following decimals into like decimals we get;

1.20 and 22.50

Now, expressing each of the numbers without the decimals as the product of primes we get

$$120 = 2 \times 2 \times 2 \times 3 \times 5 = 2^3 \times 3 \times 5$$

$$2250 = 2 \times 3 \times 3 \times 5 \times 5 \times 5 = 2 \times 3^2 \times 5^3$$

$$\text{Now, H.C.F. of 120 and 2250} = 2 \times 3 \times 5 = 30$$

Therefore, the H.C.F. of 1.20 and 22.5 = 0.30 (taking 2 decimal places)

$$\text{L. C. M. of 120 and 2250} = 2^3 \times 3^2 \times 5^3 = 9000$$

Therefore, L.C.M. of 1.20 and 22.5 = 90.00 (taking 2 decimal places)

17. Find the H.C.F. and the L.C.M. of 0.48, 0.72 and 0.108

Ans. Given, 0.48, 0.72 and 0.108

Converting each of the following decimals into like decimals we get;

0.480, 0.720 and 0.108

Now, expressing each of the numbers without the decimals as the product of primes we get

$$480 = 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 5 = 2^5 \times 3 \times 5$$

$$720 = 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 5 = 2^4 \times 3^2 \times 5$$

$$108 = 2 \times 2 \times 3 \times 3 \times 3 = 2^2 \times 3^3$$

$$\text{Now, H. C. F. of 480, 720 and 108} = 2^2 \times 3 = 12$$

Therefore, the H.C.F. of 0.48, 0.72 and 0.108 = 0.012 (taking 3 decimal places)

$$\text{L. C. M. of 480, 720 and 108} = 2^5 \times 3^3 \times 5 = 4320$$

Therefore, L.C.M. of 0.48, 0.72, 0.108 = 4.32 (taking 3 decimal places)

18. Express 0.4 as a vulgar fraction.

Ans. Let $n = 0.4$

$$n = 0.444 \dots \dots \dots \text{ (i)}$$

Since, one digit is repeated after the decimal point, so we multiply both sides by 10.

$$\text{Therefore, } 10n = 4.44 \dots \dots \dots \text{ (ii)}$$

Subtracting (i) from (ii) we get;

$$10n - n = 4.44 - 0.44$$

$$9n = 4$$

$$n = \frac{4}{9} \text{ [dividing both the sides of the equation by 9]}$$

Therefore, the vulgar fraction = $\frac{4}{9}$

19. Express 0.18 as vulgar fraction.

Ans. $x = 0.1\bar{8}$

Multiply both sides by 10 (Since number of digits without bar is 1)

$$10x = 1.\bar{8}$$

$$10x = 1.88\dots\dots \text{ (i)}$$

$10 \times 10x = 1.88\dots\dots \times 10$ (Since number of digits having bars is 1)

$$100x = 18.8\dots\dots \text{ (ii)}$$

Subtracting (i) from (ii)

$$100x - 10x = 18.8 - 1.8$$

$$90x = 17$$

$$x = \frac{17}{90}$$

Therefore, the vulgar fraction = $\frac{17}{90}$.

20. Simplify using BODMAS/PEMDAS rule:

(a) $8 - 4.2 \div 6 + 0.3 \times 0.4$

(b) $7.6 - [3 + 0.5 \text{ of } (3.1 - 2.3 \times 1.02)]$

(c) $12.8 - 0.4 \text{ of } (7.2 - 3.7) + 2.4 \times 3.02$

Ans. (a) $8 - 4.2 \div 6 + 0.3 \times 0.4$

$$8 - 4.2 \div 6 + 0.3 \times 0.4$$

$$= 8 - 0.7 + 0.3 \times 0.4, \text{ (Simplifying 'division' } 4.2 \div 6 = 0.7)$$

$$= 8 - 0.7 + 0.12, \text{ (Simplifying 'multiplication' } 0.3 \times 0.4 = 0.12)$$

$$= 7.3 + 0.12, \text{ (Simplifying 'subtraction' } 8 - 0.7 = 7.3)$$

$$= 7.42, \text{ (Simplifying 'addition' } 7.3 + 0.12 = 7.42)$$

(b) $7.6 - [3 + 0.5 \text{ of } (3.1 - 2.3 \times 1.02)]$

$$7.6 - [3 + 0.5 \text{ of } (3.1 - 2.3 \times 1.02)]$$

$$= 7.6 - [3 + 0.5 \text{ of } (3.1 - 2.346)], \text{ (Simplifying } 2.3 \times 1.02 = 2.346)$$

$$= 7.6 - [3 + 0.5 \text{ of } 0.754], \text{ (Simplifying 'subtraction' } 3.1 - 2.346 = 0.754)$$

$$= 7.6 - [3 + 0.5 \times 0.754], \text{ (Simplifying 'of')}$$

$$= 7.6 - [3 + 0.377], \text{ (Simplifying 'multiplication' } 0.5 \times 0.754 = 0.377)$$

$$= 7.6 - 3.377, \text{ (Simplifying 'addition' } 3 + 0.377 = 3.377)$$

$$= 4.223, \text{ (Simplifying 'subtraction' } 7.6 - 3.377 = 4.223)$$

(c) $12.8 - 0.4 \text{ of } (7.2 - 3.7) + 2.4 \times 3.02$

$$12.8 - 0.4 \text{ of } (7.2 - 3.7) + 2.4 \times 3.02$$

$$= 12.8 - 0.4 \text{ of } 3.5 + 2.4 \times 3.02, \text{ (Simplifying } 7.2 - 3.7 = 3.5)$$

$$= 12.8 - 0.4 \times 3.5 + 2.4 \times 3.02, \text{ (Simplifying 'of')}$$

$$= 12.8 - 1.4 + 2.4 \times 3.02, \text{ (Simplifying 'multiplication' } 0.4 \times 3.5 = 1.4)$$

$$= 12.8 - 1.4 + 7.248, \text{ (Simplifying 'multiplication' } 2.4 \times 3.02 = 7.248)$$

$$= 11.4 + 7.248, \text{ (Simplifying 'subtraction' } 12.8 - 1.4 = 11.4)$$

$$= 18.648, \text{ (Simplifying 'addition' } 11.4 + 7.248 = 18.648)$$