

Decimal and Fraction

Decimal fraction: A fraction in which denominator is 10 or it is 10², 10³ etc. i.e. power of 10 is called *decimal fraction* e.g. $\frac{3}{10}$, $\frac{3}{100}$ they can be represented as 0.3, 0.03 etc.

There are two types of Decimals

1. Non recurring decimal or terminating decimal
2. Recurring decimal or non terminating decimal

1. Non-recurring or terminating Decimal: As the name suggests, non-recurring means which do not reoccur or repeat i.e. they terminate or come to end e.g. 0.5, 0.25, and 0.125 etc. In order to convert these fractions, just the numerator is divided by the denominator. For example if you need to convert $\frac{1}{4}$ into decimal, divide 1 by 4 and get the answer as 0.25.

2. Recurring or non-terminating Decimal: As the name suggests recurring means which reoccur or repeat i.e. they do not terminate or come to end e.g. 0.333..., 0.545454.... etc. In order to convert these fractions, just the numerator is divided by the denominator. For example if you need to convert $\frac{1}{3}$ into decimal, divide 1 by 3 and get the answer as 0.333...

These are further of two types

- i. **Pure**
- ii. **Mixed**

Let us discuss each of them one by one:

1. **Pure recurring decimals:** This is the type of recurring decimal in which all digits or set of digits (after decimal point) repeat .e.g. $0.7777\dots$ or $2.373737\dots$. It can be simply written as $0.\dot{7}$ or $2.\overline{37}$
2. **Mixed recurring decimals:** This is the type of recurring decimal in which one or more digits after the decimal do not repeat while remaining digits or set of digits (after decimal point) repeat .e.g. $1.4232323\dots$

Let us learn now how to convert decimal into fractions i.e. recurring decimal into vulgar fraction. This will be better understood with the help of examples.

Example 1: Convert the given decimal to fraction $0.\dot{7}$

Sol: Let $x = 0.777777 \dots$ (i)

Multiplying both sides by 10 we get

$$10x = 7.7777 \dots \text{ (ii)}$$

Subtract equation (i) from (ii) we get

$$9x = 7 \Rightarrow x = 7/9.$$

Shortcut: Check the number of digits repeated and just write the same number of nines in the denominator e.g. in $0.\dot{7}$ only one digit i.e. only the digit 7 is repeated so answer is $7/9$ and in $0.\overline{73}$ two digits i.e. 7 and 3 is repeated so answer is $73/99$ and so on.

To convert mixed recurring decimal fraction into vulgar fraction

Example 2: Convert $0.2\overline{17}$ into a vulgar fraction.

Sol: Let $x = 0.2171717\dots\dots$ (i)

Multiplying both sides by 10 we get

$$10x = 2.171717\dots\dots \text{(ii)}$$

Multiplying both sides of equation (ii) by 100 we get

$$1000x = 217.171717\dots\dots \text{(iii)}$$

Subtract equation (ii) from (iii) we get

$$990x = 215 \Rightarrow x = 215/990.$$

Shortcut:

1. **In numerator:** Write the complete number after decimal digits and subtract from it the digits which are repeated. i.e. in $0.2\overline{17}$ subtract 2 from 217 to get 215 in numerator.
2. **In denominator:** Check the number of digits repeated and not repeated then write the number of nines in the denominator equal to number of digits repeated followed by number of zeros equal to number of digits not repeated i.e. in $0.2\overline{17}$, two digits 17 are repeated so two nines are there followed by one zero as only one digit 2 that is not repeated. So we get 990 in denominator. So the answer of $0.2\overline{17}$ is 215/990

Now one more concept you should understand that we take whole thing as 1 i.e. 100% and if we take apart of it or spent a fraction of it then remaining is obtained by subtracting it from 1 or in percentage from 100.

Example 3: After spending $\frac{1}{7}$ th of his income a man is left with Rs. 600.
Find his total income.

Sol: Let total income = x

Money spent = $\frac{1}{7}x \Rightarrow$ Money left = $x - \frac{1}{7}x = \frac{6}{7}x$

So according to the question

$$\frac{6}{7}x = 600 \Rightarrow x = 700.$$

Shortcut: If we spent $\frac{1}{7}$ of something, we are left with $(1 - \frac{1}{7})$ i.e. $\frac{6}{7}$ part of it. So directly $\frac{6}{7}$ of $x = 600 \Rightarrow x = 700$.

Decimal Fraction Questions and

Answers:

1. When .36 is written in simplest fractions form, the sum of the numerator and the denominator is:

(A) 15

(B) 30

(C) 45

(D) 60

Answer

Ans . A

2. Which of the following fractions is the smallest?

(A) $\frac{14}{16}$

(B) $\frac{15}{19}$

(C) $\frac{16}{21}$

(D) $\frac{17}{23}$

Answer

Ans . B

3. Which of the following fractions is less than $\frac{7}{8}$ and greater $\frac{1}{3}$?

(A) $\frac{2}{4}$

(B) $\frac{25}{29}$

(C) $\frac{9}{10}$

(D) $\frac{17}{24}$

Answer

Ans . D

4. $337.62+8.591+34.4 = ?$

(A) 371.722

(B) 391.622

(C) 380.611

(D) 463.94

Answer

Ans . C

5. $34.95 + 240.016 + 23.98 = ?$

(A) 298.1057

(B) 298.222

(C) 298.946

(D) 299.09

Answer

Ans . C

6. $48.95 - 32.006 = ?$

(A) 16.091

(B) 16.34

(C) 16.97

(D) 16.944

Answer

Ans . D

$$7. 12.1212 + 17.0005 - 9.1102 = ?$$

(A) 20.0017

(B) 20.0216

(C) 20.0115

(D) 20.1115

Answer

Ans . C

$$8. 3889 + 12.952 - ? = 3854.002$$

(A) 47.015

(B) 47.641

(C) 47.943

(D) 47.95

Answer

Ans . D

9. $832.58 - 242.31 = 779.84 - ?$

(A) 179.46

(B) 188.43

(C) 295.16

(D) None of these

Answer

Ans . D

10. $16.02 \times 0.001 = ?$

(A) 0.00

(B) 0.01602

(C) 0.16020

(D) 0.001602

Answer

Ans . B

11. $40.83 \times 1.02 \times 1.2 = ?$

(A) 41.55660

(B) 42.580643

(C) 49.97592

(D) 58.7952

Answer

Ans . C

12. How many digits will be there to the right of the decimal point in the product of 95.75 and 0.2554?

(A) 4

(B) 6

(C) 8

(D) None of these

Answer

Ans . B

13. $\frac{1}{0.04}$ is equal to :

(A) $\frac{2}{5}$

(B) $\frac{1}{40}$

(C) 0.25

(D) 25

Answer

Ans . D

14. What decimal of an hour is a second?

(A) 0.0015

(B) 0.2564

(C) .00027

(D) .000126

Answer

Ans . C

15. Which of the following fractions is greater than $\frac{3}{4}$ and less than $\frac{5}{6}$?

(A) $\frac{12}{16}$

(B) $\frac{15}{19}$

(C) $\frac{4}{5}$

(D) $\frac{17}{29}$

Answer

Ans . C

16. Which of the following numbers does not lie between $\frac{4}{5}$ and $\frac{7}{13}$?

(A) $\frac{1}{2}$

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

(C) $\frac{2}{5}$

(D) $\frac{5}{7}$

Answer

Ans . A

17. The value of $(1+.1+.01+.001)$ is:

(A) 1.003

(B) 1.011

(C) 1.003

(D) 1.111

Answer

Ans . D

18. $617+6.017+0.617+6.0017=?$

(A) 6.1852

(B) 62.154

(C) 629.6357

(D) None of these

Answer

Ans . C

19. $792.02 + 101.32 - 306.76 = ?$

(A) 586.58

(B) 783.45

(C) 118.22

(D) 2400.20

Answer

Ans . A

20. $892.7 - 573.07 - 95.007 = ?$

(A) 224.623

(B) 224.888

(C) 234.524

(D) 414.637

Answer

Ans . A

21. $138.009 + 341.981 - 146.305 = 123.6 + ?$

(A) 120.175

(B) 120.64

(C) 220.196

(D) None of these

Answer

Ans . D

22. $0.002 \times 0.5 = ?$

(A) 0.1

(B) 0.001

(C) 0.01

(D) 0.0001

Answer

Ans . B

23. $0.014 \times 0.014 = ?$

(A) 0.000196

(B) 0.0196

(C) 0.196

(D) 196.00

Answer

Ans . A

24. $3 \times 0.3 \times 0.03 \times 30 = ?$

(A) 0.0000354

(B) 0.000354

(C) 0.00243

(D) 0.0354

Answer

Ans . C

25. 4.036 divided by 0.04 gives:

- (A) 1.0009
- (B) 10.009
- (C) 100.9
- (D) None of these

Answer

Ans . C

26. $.04 \times ? = .000016$.

- (A) 0.0004
- (B) 0.004
- (C) 0.40
- (D) None of these

Answer

Ans . A

References Links

<https://www.hitbullseye.com/Fractions-and-Decimals.php#:~:text=Decimal%20fraction%3A%20A%20fraction%20in,represented%20as%200.3%2C%200.03%20etc.>

<https://www.examsbook.com/decimal-fraction-questions-and-answers-of-aptitude>