

Fractions

Simple or Vulgar Fraction

A number expressed with numerator and denominator. Say I have 3 of 10 apples then I will express it as $\frac{3}{10}$. The total is written below a horizontal or diagonal line, and the number of parts comprising the fraction (numerator) is written above. Such fractions are called vulgar fractions or simple fractions. Eg: $\left[\frac{3}{4} \right]$

Decimal Fraction

Expressing the fraction in decimal values (denominator a power of 10) is called decimal fraction. $\frac{1}{2}$ is expressed as 0.5 in decimal fraction. Eg: $\left[0.45773 \right]$

Converting a decimal to vulgar fraction:

Step 1: Calculate the total numbers after decimal point.

Step 2: Remove the decimal point from the number.

Step 3: Put 1 under the denominator and annex it with "0" as many as the total in step a.

Step 4: Reduce the fraction to its lowest terms.

Example: Consider 0.44

Step 1: Total number after decimal point is 2

Step 2 and 3: $\frac{44}{100}$

Step 4: Reducing it to lowest terms : $\frac{44}{100} = \frac{22}{50} = \frac{11}{25}$

Converting a recurring decimal to vulgar fraction

A decimal with recurring value is called recurring decimal.

E.g: $\frac{2}{9}$ will give 0.2222222..... where 2 is recurring number.

Method:

Step 1: Separate the recurring number from the decimal fraction.

Step 2: Annex denominator with "9" as many times as the length of the recurring number.

Step 3: Reduce the fraction to its lowest terms.

Example: Consider 0.2323232323

Step 1: The recurring number is 23

Step 2: $\frac{23}{99}$ [the number 23 is of length 2 so we have added two nines]

Step 3: Reducing it to lowest terms : $\frac{23}{99}$ [it can not be reduced further].

Mixed Recurring to Fractions:

If $N = 0.abcbcbc\dots$ Then $N = \frac{abc - a}{990} = \frac{\text{Repeated \& non-repeated digits} - \text{Non repeated digits}}{\text{As many 9's as repeated digits followed by as many zero as non - repeated digits}}$

Eg: $0.25757\dots = \frac{257 - 2}{990} = \frac{255}{990} = \frac{17}{60}$.

1. $20.05 + 35.603 - \dots = 43.087$

- a. 10.263
- b. 12.566
- c. 15.426
- d. 13.286

2. Which of the following fraction is smallest?

- a. $\frac{23}{28}$
- b. $\frac{14}{15}$

- c. $\frac{15}{19}$
d. $\frac{21}{24}$

3. 0.585858 is equivalent to the fraction....

- a. $\frac{58}{100}$
b. $\frac{58}{99}$
c. $\frac{85}{100}$
d. $\frac{85}{99}$

4. The value of $3.\overline{236}$ is

- a. $\frac{47}{198}$
b. $3\frac{4}{198}$
c. $\frac{48}{98}$
d. $\frac{58}{36}$

5. $0.9 \times 0.007 =$ _____

- a. 0.063
b. 0.0063
c. 0.63
d. 0.00063

6. $0.0015 \div ? = 0.003$

- a. 0.05
b. 0.005
c. 0.5
d. 5

7. $0.363 \times 0.522 + 0.363 \times 0.478 = ?$

- a. 0.522
b. 0.845
c. 0.363
d. 0.985

8. If $7125 \times 1.25 = 5700 <$ the value of $712.5 \div 12.5$ is:

- a. 5.7
b. 57
c. 570
d. .57

9. The value of $\frac{34.31 \times 0.473 \times 1.567}{0.0673 \times 23.25 \times 7.57}$ is close to

- a. 2.0
b. 1.15
c. 2.05
d. 2.15

10. Evaluate $\frac{(5.68)^2 - (4.32)^2}{5.68 - 4.32}$

- a. 8
b. 9
c. 10
d. 12

11. Evaluate $\frac{4.3 \times 4.3 \times 4.3 + 1}{4.3 \times 4.3 - 4.3 + 1}$

- a. 14.3
b. 52.3
c. 5.3
d. 42.3

12. If $\sqrt{5} = 2.24$, then the value of $\frac{5\sqrt{5}}{4\sqrt{5-.96}}$ is

- a. 14
- b. 15.2
- c. 13.4
- d. 14.5

13. If $5.51 \times 10^k = 0.0551$, then the value of k is:

- a. -4
- b. -3
- c. -2
- d. -1

14. $\frac{25.25}{2000}$ is equal to:

- a. 1.012526
- b. 0.012625
- c. 0.12526
- d. 0.12625

15. The value of $\frac{(2.502+0.064)^2 - (2.502-0.064)^2}{2.502 \times 0.064}$

- a. .25
- b. .235
- c. 4
- d. 3

16. The value of $\frac{4.5 \times 1.8 + 4.5 \times 8.2}{1.5 \times 4.5 + 1.5 \times 5.5}$

- a. 10
- b. 8
- c. 5
- d. 3

17. The value of $\frac{(.02)^2 + (0.52)^2 + (0.035)^2}{(0.002)^2 + (0.052)^2 + (0.0035)^2}$

- a. 100
- b. 1000
- c. .001
- d. .0001

18. Out of 200 donors, $\frac{1}{4}$ are men and remaining are women. Each male donor donates Rs.3000 per year and each female donor donates $\frac{1}{2}$ of that amount. What is the total yearly collection through donations?

- a. Rs.1, 50,000
- b. Rs.3, 75,000
- c. Rs.1, 40,300
- d. Rs.2, 25,000

19. One-fifth of Ramu's expenditure is equal to one-half of his savings. If his monthly income is Rs.6300 how much amount does he save?

- a. Rs.1550
- b. Rs.1800
- c. Rs.2000
- d. Rs.2350

20. The width of a rectangular hall is $\frac{1}{2}$ of its length. If the area of the hall is 450 sq.m, what is the difference between its length and breadth?

- a. 8m
- b. 10m
- c. 12m
- d. 15m

Answer & Explanations

1. Exp: $20.05 + 35.603 - 43.087 = 55.653 - 43.087 = 12.566$

2. Exp: $\frac{23}{28} = 0.821$

$\frac{14}{15} = 0.933$

$$\frac{15}{19} = 0.7894$$

$$\frac{21}{24} = 0.875$$

So, $\frac{15}{19} = 0.7894$ is smallest.

$$3. \text{ Exp: } 0.585858 = \frac{0.58}{99} = \frac{58}{990}$$

$$4. \text{ Exp: } \frac{3.236}{990} = 3 + \frac{0.236}{990} = 3 + \frac{236-1}{990} = 3 \frac{47}{198}$$

$$5. \text{ Exp: } 9 \times 7 = 63$$

Sum of decimal places = 4

So, $0.9 \times 0.007 = 0.0063$

$$6. \text{ Exp: Let } \frac{0.0015}{0.003} = 0.5$$

$$7. \text{ Exp: Given Expression} = 0.363 \times (0.522 + 0.478) = 0.363 \times 1 = 0.363$$

$$8. \text{ Exp: Given } \frac{7125}{1.25} = 5700$$

$$\frac{712.5}{12.5} = \frac{71.25}{1.25} = \frac{7125 \times 1}{1.25 \times 100} = \frac{5700}{100} = 57$$

$$9. \text{ Exp: } \frac{34.31 \times 0.473 \times 1.567}{0.0673 \times 23.25 \times 7.57} = \frac{25.4303}{11.845} = 2.15$$

$$10. \text{ Exp. Given Expression} = \frac{a^2 - b^2}{a - b} = \frac{(a + b)(a - b)}{a - b} = (a + b)$$

$$\frac{(5.68)^2 - (4.32)^2}{5.68 - 4.32} = (5.68 + 4.32) = 10$$

$$11. \text{ Exp: Given Expression} = \frac{a^3 + b^3}{a^2 - ab + b^2} = (a + b)$$

$$= (4.3 + 1) = 5.3$$

$$12. \text{ Exp: } \frac{5 \sqrt{5}}{4 \sqrt{5 - .96}} = \frac{5 \times 2.24}{4 \times 2.24 - .96} = \frac{11.2}{8.96 - .96} = \frac{11.2}{8} = 14$$

$$13. \text{ Exp: } 10^k = \frac{0.0551}{5.51} = \frac{5.51}{551} = \frac{5.51 \times 10^2}{551 \times 10^2} = \frac{1}{10^2} = 10^{-2}$$

$$14. \text{ Exp: } \frac{25.25}{2000} = \frac{2525}{200000} = 0.012625$$

$$15. \text{ Exp: } \frac{(2.502 + 0.064)^2 - (2.502 - 0.064)^2}{2.502 \times 0.064} = \frac{(a + b)^2 - (a - b)^2}{ab} = \frac{4ab}{ab} = 4$$

$$16. \text{ Exp: } \frac{4.5 \times 1.8 + 4.5 \times 8.2}{1.5 \times 4.5 + 1.5 \times 5.5} = \frac{4.5(1.8 + 8.2)}{1.5(4.5 + 5.5)} = \frac{4.5 \times 10}{1.5 \times 10} = \frac{45}{15} = 3$$

$$17. \text{ Exp: } \frac{(0.02)^2 + (0.52)^2 + (0.035)^2}{(0.002)^2 + (0.052)^2 + (0.0035)^2} = \frac{a^2 + b^2 + c^2}{(\frac{a}{10})^2 + (\frac{b}{10})^2 + (\frac{c}{10})^2},$$

where $a = .02$, $b = .52$, $c = .035$

$$= \frac{100(a^2 + b^2 + c^2)}{a^2 + b^2 + c^2} = 100$$

$$18. \text{ Exp: Number of men donors} = 200 \times \frac{1}{4} = 50$$

$$\text{Number of women donors} = 200 - 50 = 150$$

$$1 \text{ man donor donates} = \text{Rs. } 3000$$

$$\text{Therefore, } 50 \text{ men donor donates} = 3000 \times 50 = \text{Rs. } 1,50,000$$

$$1 \text{ woman donor donates} = 3000 \times \frac{1}{2} = \text{Rs. } 1500$$

$$\text{Therefore, } 150 \text{ women donor donates} = 1500 \times 150 = \text{Rs. } 2,25,000$$

$$\text{Hence total amount collected} = 1,50,000 + 2,25,000$$

$$= \text{Rs. } 3,75,000$$

$$19. \text{ Let the saving be Rs. } x$$

$$\text{Therefore, Expenditure} = \text{Rs. } (6300 - x)$$

$$\text{then, } (6300 - x) \times \frac{1}{5} = x \times \frac{1}{2}$$

$$\Rightarrow 1260 - \frac{x}{5} = \frac{x}{2}$$

$$\Rightarrow 1260 = \frac{x}{2} + \frac{x}{5}$$

$$\Rightarrow 7x = 1260$$

10

$$x = 1800$$

20. Exp: Let the length of the hall be x m

$$\text{Breadth of the hall} = \frac{1x}{2} \text{ m}$$

Area of the hall = Length * Breadth

$$450 = x * \frac{1x}{2}$$

$$x^2 = 900$$

$$x = 30$$

Difference between the length and breadth of the hall = $x - \frac{1x}{2} = x/2$

$$\frac{30}{2} = 15\text{m}$$