

NUMERICAL APTITUDE – III

Let us discuss the method of simplifying the equations having the fractions/ mixed fractions.

To simplify an equation with a set of mixed fractions connected by addition or subtraction operators, write down all the integers as one set and all the fractions as other set and simplify each one separately and combine the two results.

Directions (Q. 1-10): What will come in place of the question mark (?) in the following questions?

1. $3\frac{1}{4} + 2\frac{1}{2} - 1\frac{5}{6} = \frac{(?)^2}{10} + 1\frac{5}{12}$

- 1) 25 2) $\sqrt{5}$ 3) 625 4) 15 5) 5

ANSWER: 5

$$3\frac{1}{4} + 2\frac{1}{2} - 1\frac{5}{6} - 1\frac{5}{12} = \frac{(?)^2}{10}$$

$$\Rightarrow (3 + 2 - 1 - 1) + \left(\frac{1}{4} + \frac{1}{2} - \frac{5}{6} - \frac{5}{12}\right) = \frac{(?)^2}{10}$$

$$\Rightarrow 3 + \left(\frac{3 + 6 - 10 - 5}{12}\right) = \frac{(?)^2}{10}$$

$$\Rightarrow 3 - \frac{6}{12} = 3 - \frac{1}{2} = \frac{(?)^2}{10}$$

$$\Rightarrow \frac{5}{2} = \frac{(?)^2}{10}$$

$$\Rightarrow (?)^2 = \frac{5 \times 10}{2} = 25 = 5^2$$

∴ ? = 5

2. $1\frac{3}{8} + 1\frac{1}{4} - 1\frac{11}{16} = ?$

- 1) $\frac{13}{16}$ 2) $\frac{12}{17}$ 3) $\frac{15}{16}$ 4) $\frac{11}{16}$ 5) None of these

ANSWER: 3

$$1\frac{3}{8} + 1\frac{1}{4} - 1\frac{11}{16} = (1 + 1 - 1) + \left(\frac{3}{8} + \frac{1}{4} - \frac{11}{16}\right)$$

$$= 1 + \left(\frac{6 + 4 - 11}{16}\right)$$

$$= 1 - \frac{1}{16} = \frac{15}{16}$$

3. $\frac{11}{12} + \frac{15}{24} - \frac{5}{12} = ?$

- 1) $1\frac{1}{24}$ 2) $1\frac{1}{12}$ 3) $1\frac{1}{8}$ 4) $1\frac{3}{8}$ 5) None of these

ANSWER: 3

$$\frac{11}{12} + \frac{15}{24} - \frac{5}{12} = \frac{22+15-10}{24}$$

$$= \frac{27}{24} = \frac{9}{8} = 1\frac{1}{8}$$

4. $\frac{27}{152} \times \frac{8}{9} \div \frac{45}{19} = ?$

1) $\frac{1}{15}$

2) $\frac{2}{15}$

3) $\frac{1}{5}$

4) 15

5) None of these

ANSWER: 1

$$\frac{27}{152} \times \frac{8}{9} \div \frac{45}{19} = \frac{27}{152} \times \frac{8}{9} \times \frac{19}{45} = \frac{1}{15}$$

5. $2\frac{1.5}{5} + 2\frac{1}{6} - 1\frac{3.5}{15} = \frac{(?)^{\frac{1}{3}}}{4} + 1\frac{7}{30}$

1) 2

2) 8

3) 512

4) 324

5) None of these

ANSWER: 3

$$2\frac{1.5}{5} + 2\frac{1}{6} - 1\frac{3.5}{15} - 1\frac{7}{30} = \frac{(?)^{\frac{1}{3}}}{4}$$

$$\Rightarrow (2+2-1-1) + \left(\frac{1.5}{5} + \frac{1}{6} - \frac{3.5}{15} - \frac{7}{30} \right) = \frac{(?)^{\frac{1}{3}}}{4}$$

$$\Rightarrow 2 + \left(\frac{9+5-7-7}{30} \right) = \frac{(?)^{\frac{1}{3}}}{4}$$

$$\Rightarrow 2 + 0 = \frac{(?)^{\frac{1}{3}}}{4}$$

$$\Rightarrow (?)^{\frac{1}{3}} = 2 \times 4 = 8$$

$$\therefore ? = 8^3 = 512$$

6. $\frac{?}{\sqrt{25}} = \frac{15 \times 4 - 40}{2}$

1) 20

2) 45

3) 25

4) 50

5) None of these

ANSWER: 4

$$\frac{?}{5} = \frac{60 - 40}{2} = \frac{20}{2} = 10$$

$$? = 10 \times 5 = 50$$

7. $\frac{3}{4}$ of $\frac{2}{5}$ of $\frac{2}{3}$ of ? = 1616

1) 8080

2) 8000

3) 8050

4) 8020

5) None of these

ANSWER: 1

$$\frac{3}{4} \times \frac{2}{5} \times \frac{2}{3} \times ? = 1616$$

$$? = 1616 \times \frac{4}{3} \times \frac{5}{2} \times \frac{3}{2}$$

$$? = 1616 \times 5 = 8080$$

8. $1\frac{2}{9} \times 6\frac{3}{7} - ? = 2\frac{4}{7}$

- 1) $5\frac{1}{7}$ 2) $7\frac{2}{5}$ 3) $6\frac{1}{7}$ 4) $4\frac{5}{7}$ 5) None of these

ANSWER: 5

As the fractions are to be multiplied, the mixed fractions be converted into fractions and the operations has to be continued.

$$\frac{11}{9} \times \frac{45}{7} - ? = \frac{18}{7}$$

$$\frac{55}{7} - \frac{18}{7} = ?$$

$$? = \frac{55-18}{7} = \frac{37}{7} = 5\frac{2}{7}$$

9. $2\frac{3}{5} \times 2\frac{4}{13} \times 1\frac{1}{3} \div 1\frac{7}{9} = ?$

- 1) $2\frac{1}{4}$ 2) $4\frac{1}{4}$ 3) $\frac{7}{8}$ 4) $2\frac{1}{2}$ 5) None of these

ANSWER:5

$$2\frac{3}{5} \times 2\frac{4}{13} \times 1\frac{1}{3} \div 1\frac{7}{9} = \frac{13}{5} \times \frac{30}{13} \times \frac{4}{3} \div \frac{16}{9}$$

$$= \frac{13}{5} \times \frac{30}{13} \times \frac{4}{3} \times \frac{9}{16}$$

$$= \frac{6 \times 3}{4} = \frac{9}{2} = 4\frac{1}{2}$$

10. $1\frac{3}{4} - 1\frac{5}{6} = (?)^2 - 2\frac{1}{3}$

- 1) $\frac{3}{4}$ 2) $1\frac{1}{2}$ 3) $2\frac{1}{4}$ 4) $2\frac{1}{2}$ 5) $-\frac{3}{4}$

ANSWER: 2

$$1\frac{3}{4} - 1\frac{5}{6} + 2\frac{1}{3} = (?)^2$$

$$(1 - 1 + 2) + \left(\frac{3}{4} - \frac{5}{6} + \frac{1}{3}\right) = (?)^2$$

$$2 + \left(\frac{9-10+4}{12}\right) = (?)^2$$

$$2 + \left(\frac{3}{12}\right) = (?)^2$$

$$2 + \frac{1}{4} = (?)^2$$

$$\frac{9}{4} = (?)^2 \Rightarrow ? = \sqrt{\frac{9}{4}} = \frac{3}{2} = 1\frac{1}{2}$$

12. On simplification of the expression $5\frac{1}{4} + 3\frac{1}{2} \div 1\frac{1}{4} - 1\frac{1}{4}$, we get

- 1) $3\frac{1}{4}$ 2) $2\frac{2}{5}$ 3) $6\frac{4}{5}$ 4) $8\frac{3}{4}$ 5) None of these

ANSWER: 3

$$\begin{aligned} 5\frac{1}{4} + 3\frac{1}{2} \div 1\frac{1}{4} - 1\frac{1}{4} &= 5\frac{1}{4} + \frac{7}{2} \div \frac{5}{4} - 1\frac{1}{4} \\ &= 5\frac{1}{4} + \frac{7}{2} \times \frac{4}{5} - 1\frac{1}{4} \\ &= 5\frac{1}{4} + \frac{14}{5} - 1\frac{1}{4} \\ &= 5\frac{1}{4} + 2\frac{4}{5} - 1\frac{1}{4} \\ &= (5 + 2 - 1) + \left(\frac{1}{4} + \frac{4}{5} - \frac{1}{4}\right) \\ &= 6 + \frac{4}{5} = 6\frac{4}{5} \end{aligned}$$

13. Which is the smallest fraction among the following?

- 1) $\frac{7}{9}$ 2) $\frac{4}{5}$ 3) $\frac{6}{7}$ 4) $\frac{8}{11}$ 5) $\frac{9}{13}$

ANSWER: 5

To compare two fractions multiply numerator of a fraction with the denominator of other fraction with the respective integers. Then compare the integers and apply the relation to the respective fractions.

Comparing $\frac{7}{9}$ and $\frac{4}{5}$, then $7 \times 5 = 35$ and $4 \times 9 = 36$

∴ $36 > 35$, $\frac{4}{5} > \frac{7}{9}$. So $\frac{4}{5}$ cannot be the smallest fraction.

Now compare $\frac{7}{9}$ and $\frac{6}{7}$, then $7 \times 7 = 49$ and $6 \times 9 = 54$

∴ $54 > 49$, $\frac{6}{7} > \frac{7}{9}$. So $\frac{6}{7}$ cannot be the smallest fraction.

Now compare $\frac{7}{9}$ and $\frac{8}{11}$, then $7 \times 11 = 77$ and $8 \times 9 = 72$

∴ $77 > 72$, $\frac{7}{9} > \frac{8}{11}$. So $\frac{7}{9}$ cannot be the smallest fraction.

Finally compare $\frac{8}{11}$ and $\frac{9}{13}$, then $8 \times 13 = 104$ and $9 \times 11 = 99$

But $104 > 99 \Rightarrow \frac{8}{11} > \frac{9}{13}$. So $\frac{8}{11}$ cannot be the smallest fraction.

∴ $\frac{9}{13}$ is the smallest fraction

14. If the following fractions are arranged in ascending order (from left to right), which of them will be second from the left end?

$$\frac{3}{5}, \frac{6}{11}, \frac{9}{17}, \frac{5}{7}, \frac{4}{13}$$

- 1) $\frac{6}{11}$ 2) $\frac{4}{13}$ 3) $\frac{3}{5}$ 4) $\frac{9}{17}$ 5) None of these

ANSWER: 4

Divide the numerator and denominator of each fraction with respective numerator.

$$\frac{3}{5} = \frac{1}{1.-} \quad \frac{6}{11} = \frac{1}{1.-} \quad \frac{9}{17} = \frac{1}{1.-} \quad \frac{5}{7} = \frac{1}{1.-} \quad \frac{4}{13} = \frac{1}{3.-}$$

The numerators of all the fractions are same and the denominator of the last fraction is highest. So the fraction value is least. Therefore $\frac{4}{13}$ takes the first position from left when

arranged in ascending order. The smallest of the remaining four fractions takes the second position.

Compare $\frac{3}{5}$ and $\frac{6}{11}$, then $3 \times 11 = 33$ and $6 \times 5 = 30$

∴ $33 > 30$, $\frac{3}{5} > \frac{6}{11}$. ∴ $\frac{3}{5}$ cannot be smallest of the four.

Now compare $\frac{6}{11}$ and $\frac{9}{17}$, then $6 \times 17 = 102$ and $9 \times 11 = 99$

∴ $102 > 99$, $\frac{6}{11} > \frac{9}{17}$. ∴ $\frac{6}{11}$ cannot be smallest of the four.

Now compare $\frac{9}{17}$ and $\frac{5}{7}$, then $9 \times 7 = 63$ and $5 \times 17 = 85$

∴ $85 > 63$, so $\frac{5}{7} > \frac{9}{17}$. ∴ $\frac{5}{7}$ cannot be smallest of the four.

∴ $\frac{9}{17}$ is the smallest of the remaining four and takes the second position from left in ascending order

15. What will come in place of the question mark (?) in the following question?

$$2\frac{2}{3} \times 1\frac{1}{2} + 7\frac{5}{9} = ?$$

- 1) $11\frac{1}{3}$ 2) $11\frac{2}{3}$ 3) $10\frac{4}{9}$ 4) $11\frac{5}{9}$ 5) None of these

ANSWER: 4

$$2\frac{2}{3} \times 1\frac{1}{2} = \frac{8}{3} \times \frac{3}{2} = 4$$

$$\begin{aligned} \therefore 2\frac{2}{3} \times 1\frac{1}{2} + 7\frac{5}{9} &= 4 + 7\frac{5}{9} \\ &= 11\frac{5}{9} \end{aligned}$$

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