

Spardhaguru Skill Edge Aptitude Academy

1st Floor, 608, Panchamantra Rd, P and T Block, Jayanagar, Kuvempunagara, Mysuru, Karnataka 570023

Mastering fraction shortcuts is essential for saving time and maintaining accuracy in competitive examinations like Banking, SSC, RRB, and State PSCs.

Here are the key fraction concepts, short tricks, and application techniques used in competitive exams:

1. Fast Fraction Comparison Tricks

Trick 1: Cross-Multiplication Method (Best for 2 Fractions)

To determine which fraction is larger between $\frac{a}{b}$ and $\frac{c}{d}$, compare $a \times d$ and $b \times c$:

- **Example:** Compare $\frac{4}{5}$ and $\frac{2}{7}$.
 - Multiply $4 \times 7 = 28$
 - Multiply $5 \times 2 = 10$
 - Since $28 > 10$, $\frac{4}{5} > \frac{2}{7}$.

Trick 2: Constant Difference Rule

If the difference between the numerator (N) and denominator (D) is the same across multiple proper fractions ($N < D$):

- **Rule:** The fraction with the **largest digits** is the **largest fraction**.
- **Example:** Compare $\frac{13}{15}$, $\frac{17}{19}$, and $\frac{21}{23}$.
 - Difference for all: $15 - 13 = 2$, $19 - 17 = 2$, $23 - 21 = 2$.
 - **Largest:** $\frac{21}{23}$ | **Smallest:** $\frac{13}{15}$

Trick 3: Same Numerator / Same Denominator Rule

- **Same Numerator:** The fraction with the **smaller denominator** is larger (e.g., $\frac{5}{8} > \frac{5}{12}$).

- **Same Denominator:** The fraction with the **larger numerator** is larger (e.g., $\frac{7}{11} > \frac{4}{11}$).

2. Mixed Fraction Addition & Subtraction Shortcuts

Instead of converting mixed fractions to improper fractions, separate whole numbers from fractional parts.

$$\text{Format: } A\frac{a}{b} + C\frac{c}{d} = (A + C) + \left(\frac{a}{b} + \frac{c}{d}\right)$$

Example 1: Addition

$$\text{Solve: } 12\frac{1}{2} + 12\frac{1}{3} + 12\frac{1}{6}$$

1. Group whole numbers: $12 + 12 + 12 = 36$
2. Add fractions: $\frac{1}{2} + \frac{1}{3} + \frac{1}{6} = \frac{3+2+1}{6} = \frac{6}{6} = 1$
3. Total: $36 + 1 = 37$

Example 2: Quick Subtraction from a Whole Number

To subtract a proper fraction from an integer, reduce the integer by 1 and subtract the numerator from the denominator:

$$\text{Solve: } 100 - \frac{7}{13}$$

- Whole part: $100 - 1 = 99$
- Fractional part: $\frac{13-7}{13} = \frac{6}{13}$
- **Answer:** $99\frac{6}{13}$

3. Essential Fraction-to-Percentage Reciprocals

Memorizing standard fraction reciprocals helps speed up calculations in **Simplification, Profit & Loss, Simple/Compound Interest, and Percentage** problems.

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Fraction	Percentage	Fraction	Percentage
$\frac{1}{2}$	50%	$\frac{1}{9}$	11.11%
$\frac{1}{3}$	33.33%	$\frac{1}{10}$	10%
$\frac{1}{4}$	25%	$\frac{1}{11}$	9.09%
$\frac{1}{5}$	20%	$\frac{1}{12}$	8.33%
$\frac{1}{6}$	16.66%	$\frac{1}{13}$	7.69%
$\frac{1}{7}$	14.28%	$\frac{1}{14}$	7.14%
$\frac{1}{8}$	12.5%	$\frac{1}{15}$	6.66%

4. Telescoping Series Trick for Simplification

For expressions where denominators form consecutive factor pairs:

Find the value of: $\frac{1}{1 \times 2} + \frac{1}{2 \times 3} + \frac{1}{3 \times 4} + \dots + \frac{1}{n(n+1)}$

Shortcut Formula: $\frac{\text{Number of terms}}{\text{First term} \times \text{Last term}}$

• **Example:** $\frac{1}{2} + \frac{1}{6} + \frac{1}{12} + \frac{1}{20} + \frac{1}{30} + \frac{1}{42}$

- Express denominators as consecutive factors:

$$\frac{1}{1 \times 2} + \frac{1}{2 \times 3} + \frac{1}{3 \times 4} + \frac{1}{4 \times 5} + \frac{1}{5 \times 6} + \frac{1}{6 \times 7}$$

- Total terms (N) = 6
- First term denominator factor = 1
- Last term denominator factor = 7
- Answer:** $\frac{6}{1 \times 7} = \frac{6}{7}$

5. HCF & LCM of Fractions

- LCM of Fractions = $\frac{\text{LCM of Numerators}}{\text{HCF of Denominators}}$
- HCF of Fractions = $\frac{\text{HCF of Numerators}}{\text{LCM of Denominators}}$

1) $\frac{1}{4} + \frac{5}{4} = ?$

- a) $\frac{1}{8}$ b) $\frac{6}{9}$ c) $\frac{4}{7}$ d) $\frac{3}{2}$

2) $\frac{1}{3} + \frac{2}{4} = ?$

- a) $\frac{6}{5}$ b) $\frac{5}{4}$ c) $\frac{5}{6}$ d) $\frac{4}{5}$

3) $\frac{1}{3} - \frac{2}{4} = ?$

- a) $-\frac{1}{6}$ b) $\frac{1}{6}$ c) $\frac{5}{6}$ d) $-\frac{5}{6}$

4) $\frac{1}{3} \times \frac{2}{4} = ?$

- a) $\frac{1}{6}$ b) $\frac{1}{12}$ c) $\frac{2}{12}$ d) $\frac{12}{5}$

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

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a) $5\frac{3}{2}$

b) $4\frac{3}{5}$

c) $7\frac{5}{3}$

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

6) $3\frac{1}{6} + 2\frac{1}{4} = ?$

a) $6\frac{4}{12}$

b) $4\frac{4}{9}$

c) $5\frac{5}{12}$

d) $7\frac{1}{24}$

7) $2\frac{4}{6} + 3\frac{4}{6} = ?$

a) $6\frac{1}{5}$

b) $3\frac{1}{4}$

c) $5\frac{1}{6}$

d) $6\frac{1}{3}$

8) $2\frac{1}{4} - 3\frac{2}{4} = ?$

a) $-\frac{4}{3}$

b) $-\frac{3}{4}$

c) $\frac{4}{3}$

d) $-\frac{1}{5}$

9) $5 - \frac{3}{5} = ?$

a) $9\frac{2}{5}$

b) $9\frac{5}{3}$

c) $\frac{2}{4}$

d) $\frac{1}{6}$

10) $6 - \frac{47}{49} = ?$

a) $8\frac{3}{43}$

b) $4\frac{8}{23}$

c) $5\frac{2}{49}$

d) $9\frac{3}{41}$

11) $17 - \frac{47}{49} = ?$

a) $15\frac{2}{43}$

b) $21\frac{3}{67}$

c) $16\frac{2}{49}$

d) $\frac{4}{56}$

12) $3 - \frac{88}{96} = ?$

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

b) $2\frac{1}{12}$

c) $8\frac{1}{6}$

d) $4\frac{12}{14}$

RULE OF DMAS

13) $\frac{1}{2} + \frac{3}{2} \times \frac{4}{6} \div \frac{1}{8} = ?$

a) $8\frac{1}{3}$

b) $8\frac{1}{2}$

c) $4\frac{1}{3}$

d) $7\frac{1}{4}$

14) $\frac{1}{2} + \frac{3}{6} \times \frac{4}{2} + \frac{6}{2} = ?$

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a) $7\frac{1}{2}$

b) $7\frac{1}{2}$

c) $4\frac{1}{2}$

d) $2\frac{1}{2}$

15) $\frac{1}{2} + \frac{2}{6} + \frac{2}{3} \times \frac{4}{6}$

a) $1\frac{5}{18}$

b) $\frac{4}{6}$

c) $5\frac{1}{4}$

d) $5\frac{5}{6}$

16) $\frac{1}{2} \times \frac{4}{3} + \frac{6}{2} \div \frac{1}{9}$

a) $26\frac{2}{3}$

b) $27\frac{2}{3}$

c) $29\frac{2}{3}$

d) $23\frac{2}{3}$

17) $\frac{1}{2} \{ 3 \times 4 \div 3 \} + [\sqrt{12 \times 145 \div 6 + 34}]$

a) $22\frac{1}{2}$

b) $26\frac{1}{2}$

c) $21\frac{1}{2}$

d) $27\frac{1}{2}$

18) $\sqrt{\frac{16}{4}} + \frac{18}{9} \times \frac{9}{2} \div \sqrt{\frac{4}{9}}$

a) $43\frac{1}{2}$

b) $42\frac{1}{2}$

c) $44\frac{1}{2}$

d) $44\frac{1}{2}$

19) $\frac{6}{3} \div \frac{8}{7} \times \frac{7}{4} + [4 + \frac{1}{2}]$

a) $9\frac{3}{12}$

b) $4\frac{4}{13}$

c) $7\frac{9}{16}$

d) $8\frac{3}{19}$

20) $\frac{4}{3} + \frac{8}{6} \div \frac{2}{4} \times \frac{6}{12}$

a) $2\frac{3}{2}$

b) $4\frac{2}{3}$

c) $2\frac{2}{3}$

d) $3\frac{3}{2}$

RULE OF ODMAS

21) $3\frac{1}{3} \div \frac{5}{3} - \frac{1}{10}$ of $2\frac{1}{2} + \frac{7}{4}$

a) $4\frac{1}{2}$

b) $3\frac{1}{2}$

c) $2\frac{1}{2}$

d) $6\frac{1}{2}$

22) 45 of $\frac{3}{5} \div 1\frac{2}{3} + 3$ of $\frac{1}{3} - 10$

a) $8\frac{1}{4}$

b) $7\frac{1}{5}$

c) $4\frac{1}{2}$

d) $2\frac{1}{4}$

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23) 43 of $\frac{1}{86} \div \frac{1}{14} \times \frac{2}{7} + \frac{9}{4} - \frac{1}{4}$

- a) 8 b) 7
c) 4 d) 3

RULE OF BODMAS

24) $\frac{9}{10} \div \left(\frac{3}{5} + \frac{21}{10} \right)$

- a) $\frac{1}{5}$ b) $\frac{1}{4}$
c) $\frac{1}{8}$ d) $\frac{1}{3}$

25) $\frac{9}{10} \div \left(\frac{3}{5} + \frac{53}{10} \right)$

- a) $\frac{4}{65}$ b) $\frac{3}{21}$
c) $\frac{9}{59}$ d) $\frac{9}{34}$

26) $\frac{9}{10} \div \left(\frac{3}{5} - 2 \frac{1}{10} \right)$

- a) $\frac{2}{3}$ b) $-\frac{5}{7}$
c) $-\frac{3}{5}$ d) $-\frac{9}{8}$

27) $\left(8 \frac{1}{4} - 7 \frac{1}{4} \right)$ of $\left(\frac{2}{5} + \frac{3}{15} \right)$

a) $\frac{3}{5}$
c) $\frac{4}{9}$

b) $\frac{2}{4}$
d) $\frac{6}{7}$

28. $\{ 18 + \left(2 \frac{1}{2} + \frac{4}{5} \right) \}$ of $\frac{1}{1000}$

- a) 0.265 b) 0.0213
c) 0.2565 d) 0.1254

29. $\frac{3}{2} \times \frac{4}{3} \times \frac{7}{4} \times \frac{1}{8}$

- a) $\frac{7}{16}$ b) $\frac{7}{13}$
c) $\frac{7}{19}$ d) $\frac{4}{16}$

30. $\frac{7}{3} \div \frac{7}{3} \times \frac{12}{4} + \frac{7}{4}$

- a) $5 \frac{3}{5}$ c) $7 \frac{6}{5}$
c) $4 \frac{3}{4}$ d) $5 \frac{1}{3}$

31) $(-10) - [(-5) - \{ -11 - (8 - 10 - 3) \}]$

- a) -10 b) -13
c) -14 d) -11

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32) $\{18 \div (-6)\} \div (-24) \div \{(-24) \div (-8)\}$

- a) $\frac{1}{23}$ b) $\frac{1}{22}$
c) $\frac{1}{24}$ d) $\frac{1}{27}$

33) $\frac{1}{2\frac{1}{3}} + \frac{1}{1\frac{3}{4}}$

- a) 0 b) 2
c) 1 d) None of these

34) $1 + 1 \div \{1 + 1 \div (1 + \frac{1}{3})\}$

- a) $1\frac{4}{7}$ b) $1\frac{4}{5}$
c) $1\frac{6}{7}$ d) $1\frac{7}{9}$

35) $1 \div [1 + 1 \div \{1 + 1 \div 1(1 + 1 \div 2)\}]$

- a) $\frac{4}{6}$ b) $\frac{3}{9}$
c) $\frac{1}{2}$ d) $\frac{5}{8}$

36) $54 \div 66 \div 33$

- a) $\frac{3}{121}$ b) $\frac{6}{211}$

c) $\frac{1}{122}$

d) $\frac{2}{311}$

37) $\frac{1}{6} \div \frac{1}{6} \text{ of } \frac{1}{6}$

- a) 9 b) 6
c) 5 d) 2

38) $\frac{1}{6} \text{ of } \frac{1}{6} \div \frac{1}{6}$

- a) $\frac{1}{6}$ b) 8
c) $\frac{1}{4}$ d) $\frac{1}{5}$

39) $\frac{1}{6} \div \frac{1}{6} \text{ of } \frac{1}{6}$

- a) 34 b) 36
c) 39 d) 31

40. $\frac{1}{4} \div \frac{1}{4} \text{ of } \frac{1}{4}$

- a) 15 b) 17
c) 16 d) 10

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$$41) \frac{\frac{1}{6} \text{ of } \frac{1}{6} \div \frac{1}{6}}{\frac{1}{6} \div \frac{1}{6} \text{ of } \frac{1}{6}}$$

- a) $\frac{1}{36}$ b) $\frac{1}{35}$
c) $\frac{1}{33}$ d) $\frac{1}{30}$

$$42) \frac{\frac{1}{4} \text{ of } \frac{1}{4} \div \frac{1}{4}}{\frac{1}{4} \div \frac{1}{4} \text{ of } \frac{1}{4}}$$

- a) $\frac{1}{15}$ b) $\frac{1}{14}$
c) $\frac{1}{16}$ d) $\frac{1}{19}$

$$43) \frac{2+2 \times 2}{2 \div 2 \times 2}$$

- a) 6 b) 7
c) 4 d) 3

$$44) \frac{1\frac{1}{3}}{1\frac{1}{2}}$$

- a) $\frac{8}{9}$ b) $\frac{7}{8}$
c) $\frac{1}{5}$ d) $\frac{3}{6}$

$$45) \frac{\frac{2}{3} \div \frac{5}{6} \text{ of } \frac{3}{4}}{\frac{2}{3} \div \frac{3}{4} \times \frac{5}{8}}$$

- a) $\frac{44}{48}$ b) $\frac{34}{11}$
c) $\frac{48}{25}$ d) $\frac{45}{47}$

$$46) \frac{2+2 \times 2}{2 \div 2 \times 2} \div \frac{\frac{1}{2} \div \frac{1}{2} \text{ of } \frac{1}{2}}{\frac{1}{2} + \frac{1}{2} \text{ of } \frac{1}{2}} \times \frac{1\frac{1}{3}}{1\frac{1}{2}}$$

- a) 0 b) 3
c) 4 d) 1

$$47) \frac{\frac{2}{3} \div \frac{5}{6} \text{ of } \frac{3}{4}}{\frac{2}{3} \div \frac{3}{4} \times \frac{5}{8}} \div \frac{3\frac{1}{5}}{3\frac{1}{3}}$$

- a) 9 b) 2
c) 3 d) 5

$$48) \frac{\frac{2}{3} \div \frac{5}{6} \text{ of } \frac{3}{4}}{\frac{2}{3} \div \frac{3}{4} \times \frac{5}{8}} \div \frac{3\frac{1}{5}}{3\frac{1}{3}} \text{ of } \frac{375}{1000}$$

- a) $5\frac{3}{9}$ b) $6\frac{4}{5}$
c) $6\frac{1}{3}$ d) $3\frac{6}{8}$

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49. $\frac{\frac{1}{2} \div 4 + 20}{\frac{1}{2} \times 4 + 20}$

- a) $\frac{121}{143}$ b) $\frac{161}{176}$
c) $\frac{111}{112}$ d) $\frac{134}{123}$

50. $[11 \div 2 \frac{1}{5}] \div \frac{11}{5}$ of $2 \frac{1}{2} - 2$

- a) $-\frac{12}{13}$ b) $-\frac{13}{14}$
c) $-\frac{14}{15}$ d) $\frac{12}{13}$

51. $\sqrt{\frac{256}{361}} \div \sqrt{\frac{12.1}{81 \times 0.1}}$

- a) $\frac{133}{124}$ b) $\frac{190}{187}$
c) $\frac{144}{209}$ d) $\frac{144}{210}$

52. $\frac{3 \frac{1}{4} - \frac{4}{5} \text{ of } \frac{5}{6}}{4 \frac{1}{3} \div \frac{1}{5} - \left[\frac{3}{10} + 2 + \frac{1}{5} \right]}$

- a) $12 \frac{1}{2}$ b) $15 \frac{1}{2}$
c) $11 \frac{1}{2}$ d) $17 \frac{1}{2}$

53. $\frac{\frac{1}{4} + \frac{1}{4} \div 1 \frac{1}{4}}{\frac{1}{4} \times \frac{1}{4} + 2 \frac{1}{4}}$

- a) $\frac{45}{189}$ b) $\frac{36}{185}$
c) $\frac{13}{142}$ d) $\frac{45}{143}$

54. $\frac{1}{4} + \frac{1}{4 \times 5} + \frac{1}{4 \times 5 \times 6}$

- a) $\frac{37}{120}$ b) $\frac{34}{126}$
c) $\frac{33}{129}$ d) $\frac{23}{122}$