



Addition and Subtraction of Fractions

Addition of Fractions

1. Like Denominators

- Add the numerators
- Keep the denominator same

Example:

$$\frac{2}{7} + \frac{3}{7} = \frac{(2 + 3)}{7} = \frac{5}{7}$$

2. Unlike Denominators

- Find LCM (Least Common Denominator)
- Convert both to like fractions
- Add numerators, keep the denominator same

Example:

$$\frac{1}{4} + \frac{1}{6}$$

LCM of 4 and 6 = 12

Convert:

$$\frac{1}{4} = \frac{3}{12}, \frac{1}{6} = \frac{2}{12}$$

$$\text{Now: } \frac{3}{12} + \frac{2}{12} = \frac{5}{12}$$

Subtraction of Fractions

1. Like Denominators

Example:

$$\frac{5}{9} - \frac{2}{9} = \frac{(5 - 2)}{9} = \frac{3}{9} = \frac{1}{3}$$

2. Unlike Denominators

Example:

$$\frac{5}{6} - \frac{1}{4}$$

LCM of 6 and 4 = 12



Convert:

$$\frac{5}{6} = \frac{10}{12}, \frac{1}{4} = \frac{3}{12}$$

$$\text{Now: } \frac{10}{12} - \frac{3}{12} = \frac{7}{12}$$

Properties of Addition and Subtraction of Fractions:

- i. Fractions must have same denominators to add or subtract easily.
- ii. Convert unlike fractions to like fractions using LCM.
- iii. Always simplify the final answer if possible.
- iv. Addition and subtraction of fractions follow normal number rules.

Proper, Improper or Mixed fractions can be added
subtracted

- v. Mixed fractions can be converted to improper fractions before solving.

Bonus Tip:

To add or subtract mixed numbers:

Convert to improper fractions → solve → convert back if needed

Example:

$$1\frac{1}{2} + 2\frac{1}{3} =$$

$$= \frac{3}{2} + \frac{7}{3}$$

$$\text{LCM} = 6$$

$$= \frac{9}{6} + \frac{14}{6} = \frac{23}{6} = 3\frac{5}{6}$$

Summary:

- **Like denominators:** Add
subtract numerators
- **Unlike denominators:** Convert using LCM
- Always simplify the answer

Example: $\frac{2}{5} + \frac{1}{5} = \frac{3}{5}$

Example: $\frac{7}{8} - \frac{3}{8} = \frac{4}{8} = \frac{1}{2}$