

Note: $\frac{\text{numerator}}{\text{denominator}}$

Method #1

How can we add fractions?

Steps to solve:

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

Final Answer = $\frac{5}{6}$

- 1) Multiply the denominators and that will be your answer's denominator
- 2) To get the numerator, we will cross multiply and add those values together.

How can we add fractions with the same denominator?

- We can keep the denominator the same and add the numerators.

$$\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$$

Final Answer =

$$\frac{6}{7}$$

Method #2

There is another way to add fractions, you will just need to find a common denominator

Based on the denominators we have:

* What is the least common multiple between 2 and 3?
(Smallest number we can multiply by 2 and 3 to give us the same denominator).

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

$\times 3$ $\times 2$

✓

6

$$= \frac{3}{6} + \frac{2}{6} = \frac{5}{6}$$

Whatever we multiply the denominator by, we will also need to multiply the numerator with the same number.

Final Answer =

$$\frac{5}{6}$$

To subtract fractions, we will do the same thing, except we will subtract the numerators instead.

Method #1

$$\frac{1}{2} - \frac{1}{3} = \frac{3-2}{6} = \frac{1}{6}$$

Final Answer = $\frac{1}{6}$

Method #2

$$\frac{\cancel{1} \times 3}{\cancel{2} \times 3} - \frac{\cancel{1} \times 2}{\cancel{3} \times 2} = \frac{3}{6} - \frac{2}{6} = \frac{1}{6}$$

Final Answer = $\frac{1}{6}$

What if they have the same denominator?

$$\frac{5}{7} - \frac{1}{7} = \frac{4}{7}$$

- keep the denominator the same and subtract the numerators

Final Answer = $\frac{4}{7}$

How can we multiply fractions?

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

Steps to solve:

- 1) Multiply numerators
- 2) Multiply denominators

Final Answer = $\frac{8}{15}$

How can we divide fractions?

*Note: A reciprocal of a fraction is just switching the numerator with the denominator.

$$\frac{5}{6} \quad \text{Reciprocal} = \frac{6}{5}$$

Lets solve a problem!

$$\frac{3}{5} \div \frac{2}{3}$$

Steps to solve:
1) Flip the second fraction (reciprocal) and multiply

$$\frac{3}{5} \times \frac{3}{2} = \frac{3 \times 3}{5 \times 2} = \frac{9}{10}$$

Final Answer = $\frac{9}{10}$

Reducing fractions

$$\frac{3 \div 3}{6 \div 3} = \frac{1}{2}$$

$$\frac{3}{6} = \boxed{\text{ }} \quad \begin{array}{|c|c|c|}\hline & \textcolor{pink}{\boxed{\text{ }}} & \textcolor{pink}{\boxed{\text{ }}} \\ \hline & \textcolor{pink}{\boxed{\text{ }}} & \textcolor{pink}{\boxed{\text{ }}} \\ \hline \end{array}$$

$$\frac{1}{2} = \boxed{\text{ }} \quad \begin{array}{|c|}\hline \textcolor{pink}{\boxed{\text{ }}} \\ \hline \end{array}$$

Final Answer = $\frac{1}{2}$

Note:

GCF - Greatest common factor.

What is the biggest number that we can divide by the numerator and denominator without getting a decimal or fraction?

Steps to solve:

- 1) Divide top and bottom by GCF

How can we add mixed fractions?

$$2\frac{1}{6} + 4\frac{2}{3}$$

Step 1) $2 + 4 = 6$

Step 2) $\frac{1}{6} + \frac{2 \times 2}{3 \times 2} = \frac{1}{6} + \frac{4}{6} = \frac{5}{6}$

Step 3) Final Answer = $6\frac{5}{6}$

Steps to solve:

- 1) Add whole numbers together
- 2) Add fractions together
- 3) Combine them

Note: Improper fraction is a fraction where the numerator is greater than or equal to the denominator.

How can we make a mixed number into an improper fraction?

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

Step 2) $3\frac{3}{4} = \frac{12+3}{4} = \frac{15}{4}$

Final Answer = $\frac{15}{4}$

Steps:

- 1) Keep the same denominator.
- 2) multiply the whole number with the denominator then add the numerator

How can we subtract mixed fractions?

$$\begin{array}{r} 3 \frac{3}{4} \\ - 1 \frac{7}{8} \\ \hline \end{array}$$

$$\frac{12+3}{4} - \frac{8+7}{8}$$

$$\frac{15 \times 2}{4 \times 2} - \frac{15}{8}$$

$$\frac{30}{8} - \frac{15}{8} = \frac{15}{8}$$

Steps to solve:

- 1) Convert the mixed numbers to improper fractions.
- 2) Subtract
- 3) Change it back to a mixed number

* Since we started off with a mixed number in the question, our answer should also be a mixed number.

How can we change an improper fraction to a mixed number?

→ We can use long division!

Step 3)

$$\frac{15}{8}$$

denominator → $\overline{8} \sqrt{15}$

$1 \leftarrow$ whole number

$\underline{- 8}$

$7 \leftarrow$ remainder

Final Answer = $1 \frac{7}{8}$

How do we multiply mixed fractions?

$$1\frac{5}{6} \times 4\frac{1}{2}$$

Step 1) $= \frac{6+5}{6} \times \frac{8+1}{2}$

Step 2) $= \frac{11}{6} \times \frac{9}{2} = \frac{99}{12}$

Step 3)

$$\begin{array}{r} 8 \\ \hline 12 \sqrt{99} \\ - 96 \\ \hline 3 \end{array} = 8\frac{3}{12} \leftarrow \text{simplify further}$$
$$\frac{3}{12} \div 3 = \frac{1}{4}$$

Final Answer = $8\frac{1}{4}$

Steps to solve:

- 1) Convert mixed numbers to improper fractions
- 2) Multiply
- 3) Change it back to a mixed number

How can we dividing mixed fractions?

$$3\frac{1}{3} \div 2\frac{3}{5}$$

Step 1) $\frac{9+1}{3} \div \frac{10+3}{5}$

Steps to solve:

1) Convert mixed numbers to improper fractions

2) Divide

3) Change it back to a mixed number

Step 2) $\frac{10}{3} \times \frac{5}{13}$

$$\frac{10}{3} \times \frac{5}{13} = \frac{50}{39}$$

Step 3)
$$\begin{array}{r} 1 \\ 39 \sqrt{50} \\ -39 \\ \hline 11 \end{array} = 1\frac{11}{39}$$

Final Answer = $1\frac{11}{39}$