Addition of Rational Numbers

When denominators are equal:

1. Add $\frac{5}{6}$ and $\frac{7}{6}$

   Answer: $\frac{5}{6} + \frac{7}{6} = \frac{5+7}{6} = \frac{12}{6}$

2. Add $\frac{7}{5}$ and $\frac{-13}{5}$

   Answer: $\frac{7}{5} + \left(\frac{-13}{5}\right) = \frac{7-13}{5} = \frac{-6}{5}$

When one denominator is a multiple of the other denominator:

1. Solve $\frac{4}{3}$ and $\frac{5}{6}$

   Answer: We know that $\frac{4}{3} = \frac{4\times2}{3\times2} = \frac{8}{6}$

   $\left(\frac{8}{6}\right.$ is equivalent rational number of $\left.\frac{4}{3}\right)$

   So, $\frac{4}{3} + \frac{5}{6} = \frac{8}{6} + \frac{5}{6} = \frac{13}{6}$

2. Solve $\frac{-3}{7}$ and $\left(\frac{-5}{21}\right)$

   We know that

   $\frac{-3}{7} + \frac{3\times3}{7\times3} = \frac{-9}{21}$

   So, $\frac{-3}{7} + \left(\frac{-5}{21}\right) = \frac{-9}{21} - \frac{-5}{21}$

   $= \frac{-9-5}{21} = \frac{-14}{21}$

When denominator are co–prime:

1. Find the sum of $\frac{4}{5} - \frac{-6}{7}$

   Answer: So, $\frac{-4}{5} + \left[\frac{-6}{7}\right] = \frac{4\times7}{5\times7} - \frac{6\times5}{7\times5}$

   (Multiplying and dividing each fraction by the denominator of the other fraction)

   $= \frac{28}{35} - \frac{30}{35} = \frac{28-30}{5} = \frac{-2}{5}$

When denominator have a common factor:

1. Solve $\frac{5}{12} + \frac{7}{8}$

Answer: Since 12 and 8 have common factors, we will proceed by finding the LCM of 12 and 8. LCM of 12 and 8 is 2 × 2 × 2 × 3 = 24

Now we will find equivalent fractions of the given numbers having 24 in the denominator.

Hence, $\frac{5}{12} = \frac{5 \times 2}{12 \times 2} = \frac{10}{24}$

$\frac{7}{8} = \frac{7 \times 3}{8 \times 3} = \frac{21}{24}$

So, $\frac{5}{12} + \frac{7}{8} = \frac{10}{24} + \frac{21}{24} = \frac{10 + 21}{24} = \frac{31}{24}$