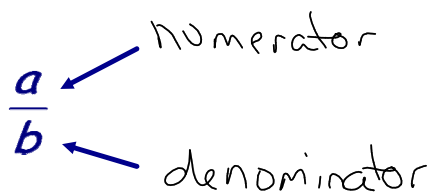


1.5A Operations with Rational Numbers Addition / Subtraction

Recall:



Common Denominator: a common multiple of the denominators of two or more fractions

Ex. 1: Determine the lowest common denominator (LCD) of each set of fractions.

a) $\frac{1}{2}, \frac{1}{4}, \frac{1}{8}$

Handwritten notes: 4x above 1/2, 4x below 1/2, x2 below 1/4, x2 below 1/8

$\frac{4}{8}, \frac{2}{8}, \frac{1}{8}$

b) $\frac{2}{3}, \frac{1}{4}, \frac{5}{2}$

Handwritten notes: 4x above 2/3, 4x below 2/3, x3 above 1/4, x3 below 1/4, x6 above 5/2, x6 below 5/2

Handwritten notes: 4? 2 ✓, 4 ✓, 3 X

$\frac{8}{12}, \frac{3}{12}, \frac{30}{12}$

Handwritten notes: 12? 2 ✓, 4 ✓, 3 ✓

Adding Fractions:

Steps:

1. Simplify signs if there is any
2. Find the lowest common Denominator
3. Add or Subtract only the numerator

$$\frac{3}{5} - \left(-\frac{2}{5}\right) = \frac{3}{5} + \frac{2}{5}$$

Ex. 2: Evaluate

a) $\frac{3}{5} + \frac{5}{4}$
 (4x3) (5x5) → 5 x 4 = 20

$$= \frac{12}{20} + \frac{25}{20}$$

$$= \frac{37}{20} \text{ (Can leave here)}$$

b) $\frac{4}{3} + \frac{1}{6} + \frac{5}{8}$
 (8x4) (8x3) (8x3) 16? 8 ✓

$$= \frac{32}{24} + \frac{4}{24} + \frac{15}{24}$$

$$= \frac{51}{24}$$

24? 3 ✓
6 ✓
8 ✓

Subtracting Fractions:

Ex. 3: Evaluate

a) $\frac{3}{5} - \frac{4}{3}$
 (3x3) (3x5)

$$= \frac{9}{15} - \frac{20}{15}$$

$$= -\frac{11}{15}$$

b) $6 - \left(-\frac{2}{3}\right)$

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

$$= \frac{18}{3} + \frac{2}{3}$$

$$= \frac{20}{3}$$

Examples

Ex. 4: Evaluate

$$\begin{aligned}
 \text{a)} \quad & \frac{2}{3} + 1\frac{1}{2} \rightarrow \frac{2+1}{2} \\
 & = \frac{2}{2} + \frac{3}{2} \\
 & = \frac{4}{6} + \frac{9}{6} \\
 & = \frac{13}{6}
 \end{aligned}$$

Steps:

1. Change mixed fractions to improper
2. Simplify signs
3. Find the lowest common Denominator
4. Add or Subtract only the numerator

$$\begin{aligned}
 \text{b)} \quad & \frac{3}{4} + 2\frac{3}{5} - \left(\frac{-7}{2}\right) - \frac{1}{10} \\
 & = \frac{3}{4} + 2\frac{3}{5} + \frac{7}{2} - \frac{1}{10} \\
 & = \frac{3}{4} + \frac{10+3}{5} + \frac{7}{2} - \frac{1}{10} \\
 & = \frac{5 \times 3}{5 \times 4} + \frac{13 \times 4}{5 \times 4} + \frac{7 \times 10}{2 \times 10} - \frac{1 \times 2}{10 \times 2} \\
 & = \frac{15}{20} + \frac{52}{20} + \frac{70}{20} - \frac{2}{20} \\
 & = \frac{135}{20} \div 5 \\
 & = \frac{27}{4}
 \end{aligned}$$

Homework is only:

Set 1: #2ace, 3ace, 4ace

Set 2: #1, 2aij, 3aceij