1.2 Adding & Subtracting Fractions

Recall: $\frac{a}{b}$ — a: numerator; b: denominator

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

Example 1: Determine the common denominator of each set of fractions.

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

LCD = lowest common denominator

8 16 24 48

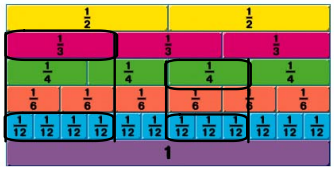
b) $\frac{2}{3}, \frac{1}{4}, \frac{5}{2}$

LCD : 12

Adding Fractions:

Example 2: $\frac{1}{3}+\frac{1}{4}$

common denominator = 12

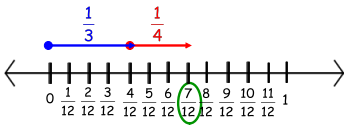


$\frac{1}{3}+\frac{1}{4} = \frac{4}{12}+\frac{3}{12}$

$= \frac{7}{12}$

Using a number line:

Mark the number line using the common denominator.



Example 3: Evaluate

a) $\frac{3}{5}\times\frac{4}{4}+\frac{5}{4}\times\frac{5}{5}$ LCD

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

$= \frac{37}{20}$ ✓

Can I simplify?

no

b) $\frac{4}{3}\times\frac{8}{8}+\frac{1}{6}\times\frac{4}{4}+\frac{5}{8}\times\frac{3}{3}$ LCD 24

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

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

$= \frac{51}{24} \div 3$

$= \frac{17}{8}$ ← improper fraction

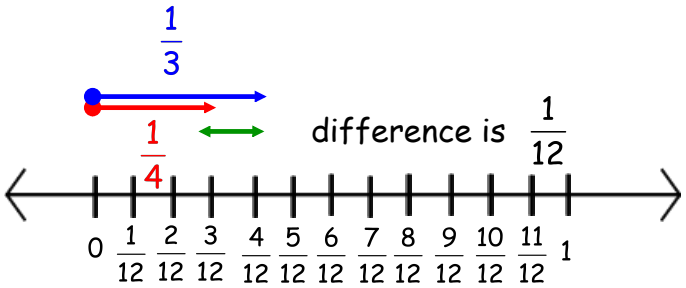
reduced

Subtracting Fractions:

Example 4: $\frac{1}{3} - \frac{1}{4}$

common denominator = 12

$$- \frac{1}{12}$$



$$\frac{1}{3} - \frac{1}{4} = \frac{4}{12} - \frac{3}{12}$$
$$= \frac{1}{12}$$

Example 5: Evaluate

a) $\frac{3}{5} - \frac{4}{3}$ LCD 15

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

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

b) $\frac{2}{3} - \frac{1}{6}$

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

$= \frac{3}{6}$ ÷3 ÷3

$= \frac{1}{2}$

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

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

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

$= \frac{20}{3}$

$-1(-3)$