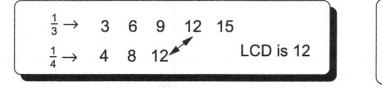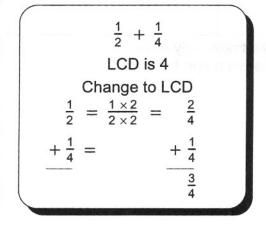# Unit 10   Adding and Subtracting Unlike Fractions

1. **Unlike fractions** have different denominators. $\frac{1}{3}$ and $\frac{1}{4}$ are unlike fractions.

2. To add and subtract fractions, their denominators must be the same.

   A.   Rewrite all fractions as equivalent (like) fractions with the lowest possible denominator. This like denominator is called the lowest common denominator (**LCD**).

   B.   To find the LCD of 1/3 and 1/4, write a few multiples for each denominator. The lowest common (equal) multiple will be the LCD.

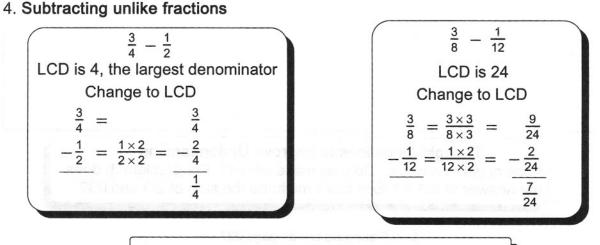$$\frac{1}{3} \rightarrow \quad 3 \quad 6 \quad 9 \quad 12 \quad 15$$

$$\frac{1}{4} \rightarrow \quad 4 \quad 8 \quad 12 \qquad \text{LCD is 12}$$

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

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

3. Adding unlike fractions

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

LCD is 4

Change to LCD

$$\frac{1}{2} = \frac{1 \times 2}{2 \times 2} = \frac{2}{4}$$

$$+\frac{1}{4} = \qquad\quad +\frac{1}{4}$$

$$\overline{\qquad\qquad\quad \frac{3}{4}}$$

Note: As shown above, the lowest common denominator may be the largest denominator.

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

$$3 \quad 6 \quad 9 \quad 12 \quad 15$$

$$5 \quad 10 \quad 15 \qquad \text{LCD is 15}$$

Change to LCD

$$\frac{2}{3} = \frac{2 \times 5}{3 \times 5} = \frac{10}{15}$$

$$+\frac{1}{5} = \frac{1 \times 3}{5 \times 3} = +\frac{3}{15}$$

$$\overline{\qquad\qquad\qquad \frac{13}{15}}$$

Reminder: A common denominator, not always the lowest, can always be found by multiplying all the denominators. In the above example, the LCD is 3 x 5 = 15.

4. Subtracting unlike fractions

$$\frac{3}{4} - \frac{1}{2}$$

LCD is 4, the largest denominator

Change to LCD

$$\frac{3}{4} = \qquad\quad \frac{3}{4}$$

$$-\frac{1}{2} = \frac{1 \times 2}{2 \times 2} = -\frac{2}{4}$$

$$\overline{\qquad\qquad\qquad \frac{1}{4}}$$

$$\frac{3}{8} - \frac{1}{12}$$

LCD is 24

Change to LCD

$$\frac{3}{8} = \frac{3 \times 3}{8 \times 3} = \frac{9}{24}$$

$$-\frac{1}{12} = \frac{1 \times 2}{12 \times 2} = -\frac{2}{24}$$

$$\overline{\qquad\qquad\qquad\quad \frac{7}{24}}$$

Note: Always reduce final answers to lowest terms.