

**GRADE 10 ESSENTIAL**  
**UNIT X – PRIOR STUDIES**  
**FRACTIONS – ADD AND SUBTRACT**

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Fractions are rather rewarding if you take the time to learn them, of course knowing your multiplication facts is somewhat critical.

Multiplication and reducing was rather easy. Adding and subtracting is less easy since you can only add '*like*' fractions; you can only add eighths ( $1/8^{\text{th}}$ ) to eighths and quarters ( $1/4^{\text{th}}$ ) to quarters, etc.

The 'slices' of your pizza have to be the same size! If your slices are '*unlike*' (different sizes) then you need to make them into the same size by cutting them up into **more** smaller slices, so the denominator gets bigger.

## Lesson 2 Least Common Multiple

The **least common multiple (LCM)** of two numbers is the least number that is a multiple of both numbers.

One way to find the LCM is to list several multiples of the numbers until you find the smallest one they have in common.

Find the least common multiple of 9 and 15.

9: 9, 18, 27, 36, 45, 54, 63, 72

15: 15, 30, 45, 60, 75, 80, 95

The LCM of 9 and 15 is 45.

Do not confuse with GCF!

**LCM: The numbers get bigger!**

Find the least common multiple of each pair of numbers.

*a*  
1. 6 and 14

6: 6, 12, 18, 24, 30, 36, 42, 48, 54, ...  
 14: 14, 28, 42, 56, 70, 84, ...

42

*b*  
12 and 18

2. 16 and 40

8 and 14

3. 27 and 42 \_\_\_\_\_ 28 and 44 \_\_\_\_\_

4. 10 and 12 \_\_\_\_\_ 6 and 15 \_\_\_\_\_

5. 15 and 18 \_\_\_\_\_ 9 and 6 \_\_\_\_\_

### Lesson 3 Common Denominators

$\frac{1}{4}$  and  $\frac{3}{4}$  have common denominators.

"Like"

$\frac{3}{4}$  and  $\frac{1}{3}$  do not have common denominators.

"Unlike"

You can rename fractions so they have common denominators by finding the least common multiple (LCM) of the denominators.

Rename  $\frac{3}{4}$  and  $\frac{1}{3}$  so they have common denominators.

The LCM of the denominators, 4 and 3, is 12.

Often any common multiple will do!

Write fractions equivalent to  $\frac{3}{4}$  and  $\frac{1}{3}$  with denominators of 12.

$$\frac{3}{4} \times \frac{3}{3} = \frac{9}{12} \quad \frac{1}{3} \times \frac{4}{4} = \frac{4}{12}$$

$\frac{9}{12}$  and  $\frac{4}{12}$  have common denominators.

Once they are "like" then add or subtract

Rename each set of fractions as fractions with common denominators.

a LCM: 15  
 1.  $\frac{2}{5}$  and  $\frac{2}{3}$   $\frac{6}{15}$  and  $\frac{10}{15}$       b  $\frac{1}{2}$  and  $\frac{3}{7}$       c \_\_\_\_\_

2.  $\frac{5}{6}$  and  $\frac{3}{8}$  LCM: ~~48~~ 24  $\frac{20}{24}$  and  $\frac{9}{24}$        $\frac{5}{8}$  and  $\frac{7}{10}$       \_\_\_\_\_

3.  $\frac{1}{4}$  and  $\frac{4}{7}$  \_\_\_\_\_

$\frac{5}{9}$  and  $\frac{7}{18}$  \_\_\_\_\_

4.  $\frac{7}{8}$  and  $\frac{1}{5}$  \_\_\_\_\_

$\frac{5}{12}$  and  $\frac{3}{8}$  \_\_\_\_\_

5.  $\frac{9}{14}$  and  $\frac{5}{7}$  \_\_\_\_\_

$\frac{5}{16}$  and  $\frac{11}{12}$  \_\_\_\_\_

## Lesson 4 Addition and Subtraction

$$\begin{array}{r} \frac{2}{3} \times 2 = \frac{4}{6} \\ + \frac{1}{2} \times 3 = \frac{3}{6} \\ \hline \frac{7}{6} = 1\frac{1}{6} \end{array}$$

The denominators are 3 and 2.  
Since  $2 \times 3 = 6$ , rename each  
fraction with a denominator of 6.

Add or subtract the fractions.

Write the answer in simplest form.

$$\begin{array}{r} \frac{2}{3} \times 2 = \frac{4}{6} \\ - \frac{1}{2} \times 3 = \frac{3}{6} \\ \hline \frac{1}{6} \end{array}$$

Write each answer in simplest form.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
1.	$\begin{array}{r} \frac{3}{5} \\ + \frac{2}{3} \\ \hline \frac{19}{15} \\ 1\frac{4}{15} \end{array}$	$\begin{array}{r} \frac{5}{6} \\ + \frac{1}{5} \\ \hline \end{array}$	$\begin{array}{r} \frac{1}{2} \\ + \frac{1}{3} \\ \hline \end{array}$	$\begin{array}{r} \frac{3}{10} \\ + \frac{1}{3} \\ \hline \end{array}$

2.	$\begin{array}{r} \frac{2}{3} \\ - \frac{1}{4} \\ \hline \end{array}$	$\begin{array}{r} \frac{5}{6} \\ - \frac{2}{5} \\ \hline \end{array}$	$\begin{array}{r} \frac{7}{8} \\ - \frac{2}{3} \\ \hline \frac{5}{24} \end{array}$	$\begin{array}{r} \frac{3}{4} \\ - \frac{1}{3} \\ \hline \end{array}$
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3. 
$$\begin{array}{r} \frac{7}{8} \\ + \frac{1}{3} \\ \hline \end{array}$$

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

$$\begin{array}{r} \frac{2}{5} \\ + \frac{3}{4} \\ \hline \end{array}$$

$$\begin{array}{r} \frac{1}{2} \\ - \frac{1}{3} \\ \hline \end{array}$$

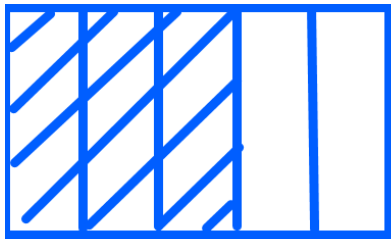
4. 
$$\begin{array}{r} \frac{1}{3} \\ + \frac{3}{4} \\ \hline \end{array}$$

$$\begin{array}{r} \frac{3}{5} \\ - \frac{1}{3} \\ \hline \end{array}$$

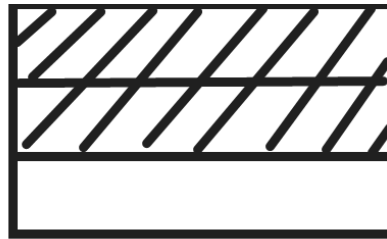
$$\begin{array}{r} \frac{1}{2} \\ + \frac{4}{5} \\ \hline \end{array}$$

$$\begin{array}{r} \frac{3}{4} \\ - \frac{2}{3} \\ \hline \end{array}$$

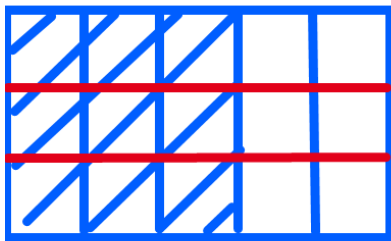
DRAW IT TO CONVINC YOURSELF



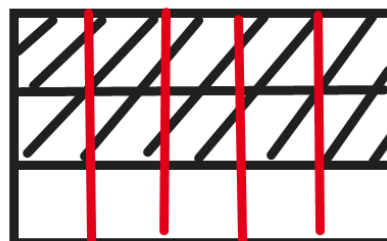
$\frac{3}{5}$



$\frac{2}{3}$



$\frac{9}{15}$



$\frac{10}{15}$