### Fraction XII Subtracting Unlike Denominators

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#### **Common Multiple**

A number that is a multiple of two or more numbers.

Some multiples of 4 & 6

12, 24, 36

#### Least Common Multiple

The smallest common multiple of a set of two or more numbers. 8 = 8, 16, 24, 32, 40, 486 = 6, 12, 18, 24, 30, 36

#### Shortcut for Finding the Least Common Denominator or Least Common Multiple

Check to see if the smaller denominator divides evenly into the larger denominator. If it does, use the larger denominator for your LCD or LCM.

 $-\frac{1}{3}$ 

3 will divide evenly into 9, so 9 is your LCD or LCM.

# Find the multiples of each denominator.

 $\overline{5} = 5, 10, 15, 20, 25, 30$  $\underline{1} = 10, 20, 30, 40, 50$ 

Compare the lists of multiples. Circle the common multiples between the two lists.

 $\overline{5} = 5,10,15,20,25,30$  $\underline{1} = 10,20,30,40,50$ 

Use the lowest common multiple as the denominator.

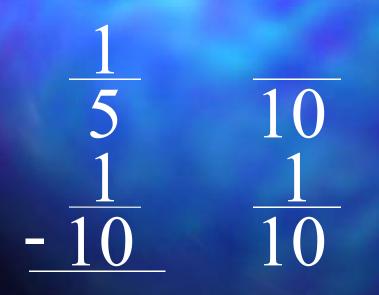
 $\overline{5} = 5, 10, 15, 20, 25, 30$  $\underline{1} = 10, 20, 30, 40, 50$ 

This number is also called the least common denominator.

 $\overline{5} = 5, 10, 15, 20, 25, 30$  $\underline{1}{10} = 10, 20, 30, 40, 50$ 

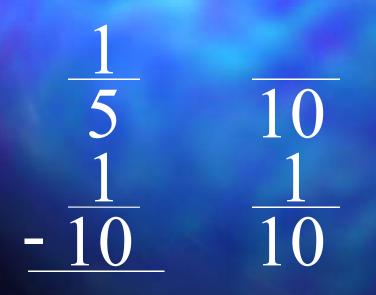
Rewrite the fractions using the least common denominator or least common multiple. 1010

Find the equivalent fractions for 1/5 & 1/10 with 10 as the denominator.



You know that 1/10 is equal to 1/10 so Put a 1 over the Bottom 10.

Find the equivalent fractions for 1/5 & 1/10 with 10 as the denominator.



To find the top number, ask yourself what do you multiply the 5 by to get 10.

Find the equivalent fractions for 1/5 & 1/10 with 10 as the denominator.

 $\begin{array}{r}
 1 \\
 1 \\
 5 \\
 1 \\
 1 \\
 1 \\
 1 \\
 1 \\
 1 \\
 1 \\
 1 \\
 1 \\
 1 \\
 1 \\
 1 \\
\end{array}$ 

That's right 2. Since you are looking for the equivalent fraction you know the top number must also be multiplied by 2.

Find the equivalent fractions for 1/5 & 1/10 with 10 as the denominator.

 $\begin{array}{c}
 1 \\
 1 \\
 5 \\
 1 \\
 1 \\
 1 \\
 1 \\
 1 \\
 1 \\
 1 \\
 1 \\
 1 \\
 1 \\
 1 \\
 1 \\
 1 \\
 1 \\
\end{array}$ 

To find the top number just multiply 2 x 1 to get your equivalent fraction.

#### **To Subtract Fractions With Unlike Denominators** Now just add the numerators. $1 \ge 2 = 2$ Remember when $5 \ge 2 = 10$ subtracting fractions you never subtract the denominators.

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Use the short cut to find the Least Common Denominator (LCD).

 $\frac{1}{2x 4 = 8}$ Now find the equivalent fractions for 1/2 & 1/8.

Ask what do you multiply 2 by to get 8 and what do you multiply 8 by to get 8.

 $\frac{1 \times 4}{2 \times 4} = 8$  $\frac{1 \times 1}{8 \times 1} = 8$ 

Since you are writing equivalent fractions, now multiply the top numbers by the same number you did in the bottom.

 $\frac{1 \times 4}{2 \times 4} = \frac{4}{8}$  $\frac{1 \times 4}{2 \times 4} = \frac{8}{8}$  $\frac{1 \times 1}{8} = \frac{1}{8}$ 

## Now multiply across.

 $\frac{1 \times 4}{2 \times 4} = \frac{4}{8}$  $1 \ge 1 = 1$  $-8 \ge 1=8$ 8

Subtract your new numerators.

 $\frac{2}{5} \quad \overline{15} \\
 \frac{1}{3} \quad \overline{15}$ 

Find the common Multiples for 5 and 3. Write This number As your new denominator.

 $\frac{2}{5 \times 3} = 15$  $\frac{1}{3 \times 5} = 15$ 

Ask yourself what you multiply the bottom number by to get 15.

 $\frac{2x 3}{5x 3} = \frac{15}{1x 5} = \frac{1}{3x 5} = \frac{15}{15}$ 

Multiply the top number by the same number you did in the bottom.

 $\frac{2x \ 3 = 6}{5x \ 3 = 15}$  $\frac{1x \ 5 = 5}{3x \ 5 = 15}$ 

Multiply across.

 $\begin{array}{r} 2x & 3 = 6\\ 5x & 3 = 15\\ 1x & 5 = 5\\ 3x & 5 = 15\\ \hline 1\\ 15\end{array}$ 

Now subtract your new numerators.

5x 4 = 206x 4 = 24 $1 \ge 3 = 3$  $-8 \times 3 = 24$ 17 24

 $\frac{2x 3}{3x 3} = \frac{6}{9}$  $-\frac{1 \times 1}{9 \times 1} = \frac{1}{9}$