

## Rules of Fractions

An understanding of “arithmetic” rules will allow for the addition and subtraction of fractions.

### Hints

#### WORD BANK

Numerator – the number on the top of the fraction.

Denominator – the number on the bottom of the fraction.

## Adding/Subtracting Fractions

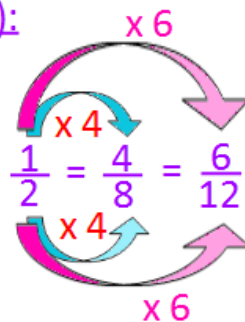
Before fractions can be added or subtracted the denominator for each fraction must be made the same. This can be done by:

1. Finding the equivalent - This can be thought of as the opposite of simplifying fractions. Choose any number, and multiply both top and bottom by that number.
2. Simplifying - Look for the highest number that divides both the numerator (top) and the denominator (bottom). This is called the highest common factor.

#### Example 1(Equivalent):

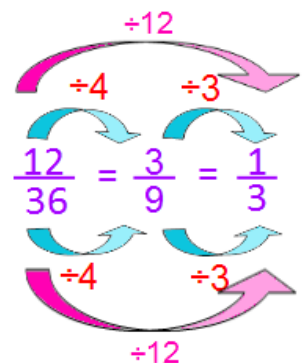
The blue arrows show how we have multiplied by 4 to make an equivalent fraction.

The pink arrows show what happens when we multiply by 6.

$$\frac{1}{2} = \frac{4}{8} = \frac{6}{12}$$


#### Example 2 (Simplifying):

12 and 36 both divide by 4 and 3. This is one way of simplifying this fraction. Alternatively, you might spot that the HCF is 12, and use this instead.

$$\frac{12}{36} = \frac{3}{9} = \frac{1}{3}$$


## Examples

To add or subtract fractions we make sure they have a **common denominator**.

To keep the calculation simple, we use the **lowest common denominator**.

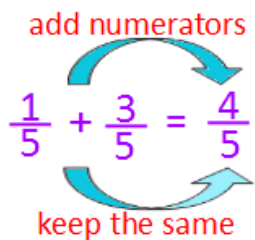
### Example 1:

The denominators are already the same here.

add numerators

$$\frac{1}{5} + \frac{3}{5} = \frac{4}{5}$$

keep the same



### Example 2:

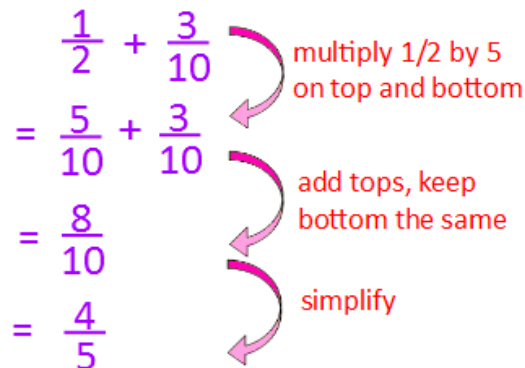
The denominators are not the same here.

$$\begin{aligned} & \frac{1}{2} + \frac{3}{10} \\ &= \frac{5}{10} + \frac{3}{10} \\ &= \frac{8}{10} \\ &= \frac{4}{5} \end{aligned}$$

multiply 1/2 by 5 on top and bottom

add tops, keep bottom the same

simplify



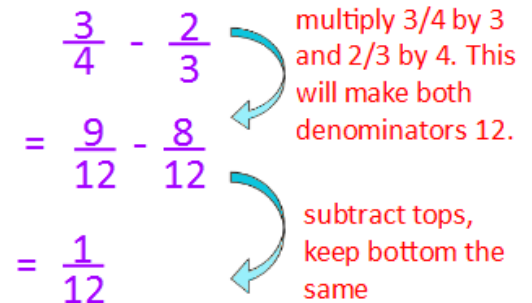
### Example 3:

The denominators are not the same here.

$$\begin{aligned} & \frac{3}{4} - \frac{2}{3} \\ &= \frac{9}{12} - \frac{8}{12} \\ &= \frac{1}{12} \end{aligned}$$

multiply 3/4 by 3 and 2/3 by 4. This will make both denominators 12.

subtract tops, keep bottom the same



## Resources

**Youtube Video with examples –**

<https://www.youtube.com/watch?v=tDQipFjAoT8>

**Fractions Games -**

<http://www.math-play.com/math-fractions-games.html>

**Worksheets –**

<https://www.math-drills.com/fractions.php>