Subtraction of Real Numbers

Whole Numbers

Subtraction is finding the difference of two numbers. Since subtraction and addition are reverse operations, don't forget that a subtraction problem can be checked by adding. Be careful the order does matter when subtracting!

When **subtracting**, start at the first number then move to the **left**, on the number line, the number of units you are subtracting from the first number. The result is the number that you end on.

Example: 12 – 5 = 7

Integers

(adding a negative)

If a and b are numbers, then a -b = a + (-b). When **subtracting**, using a number line, start at the first number then move to the **left** the number of units you are subtracting from the first number. **UNLESS** it is a negative number, then you have to move to the **right –** remember negative sign change direction. The result is the number that you end on. To subtract two numbers, add the first number to the opposite (called additive inverse) of the second number. If you have two minus signs (-) right next to each other, they make a plus sign (+).

If subtracting a positive number, this is the same as adding a negative number.
If subtracting a negative number, this is the same as adding a positive number.

Examples:

12 - 4 = 8
-12 - -4 = -8
12 - -4 = 16
-12 - 4 = -16

Decimals

1) Write the decimals so that the decimal points line up vertically.
2) Subtract as for whole numbers.
3) Place the decimal point in the sum or difference so that it lines up vertically with the decimal points in the problem.

Reminders:

- a whole number has the decimal at the end
- 0s can be placed after the last decimal place value so the numbers have the same number of decimal places.

Example:

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  54.0600
-  2.1234
  51.9366
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Fractions
Let a, b, c, d be nonzero integers.

With common denominators: $\dfrac{a}{b} - \dfrac{c}{b} = \dfrac{a-c}{b}$

Without common denominators: $\dfrac{a}{b} - \dfrac{c}{d} = \dfrac{ad - cb}{bd}$ and then you MUST reduce OR

you can find the LCM for b & d before adding, which is the Least Common Denominator(LCD) for the 2 fractions.

Least Common Multiple, LCM, is the smallest number that contains all the factors of the numbers: LCM of 3, 4, 5, 12, and 15 is 60 (= 3 · 4 · 5)
To find the LCM:
1. Write all the numbers in their prime factorization
2. Write the product that contains each unique factor.

Examples:

$$\frac{17}{7} - \frac{1}{7} = \frac{16}{7}$$

$$\frac{2}{3} - \frac{3}{5} \xrightarrow{LCD=3*5=15} \frac{2}{3}*\frac{5}{5} - \frac{3}{5}*\frac{3}{3} \xrightarrow{\text{Multiply Numerators and Denomintors}} \frac{10}{15} - \frac{9}{15} \xrightarrow{\text{Now Subtract}} \frac{1}{15}$$

Subtraction Properties of Zero
The difference of any number and that same number is 0.   9 - 9 = 0
The difference of any number and 0 is the same number.   7 - 0 = 7