Substitution.

Let's look at a very simple equation:
$$|x| = 10$$
The solution to this equation is a number, the absolute value of which is 10. There are two such numbers, 10 and (-10). Thus, this equation has two roots. (The word "root" can be used as a synonym for solution.).
$$|x| + 5 = 10$$
To make the equation a little simpler, we can substitute $|x|$ with m ($|x| = m$) and solve for m.

$$m + 5 = 10$$

$$m + 5 - 5 = 10 - 5$$

$$m = 5.$$

But the initial variable is x, not m. $|x| = m$, or, as we know, $|x| = 5$. There are two roots, 5 and (-5).

Equations are very useful to solve word problems. In each word problem there is an unknown quantity, and known parameters out of which the equation can be created.

Two unknown variables.

Vita has twice as much money as Sasha. Together they have $21. How much money does each have?

In this problem there are two unknown variables? The amount of money Vita has and the amount of money Sasha has. Let's denote Sasha's money as s, and Vita's money as v. Together $s + v = 21$. But we know also that:

$$s = 2 * v$$

We can now substitute s in the equation $s + v = 21$.

$$(2 * v) + v = 21$$

$$3 * v = 21$$

$$v = 7, \text{ and } s = 2 * v = 14$$

HW Exercises:

1. Buns and cookies are sold in the bakery. Each bun costs $2 and each cookie costs $0.50. $83.50 was made this Monday. 56 buns and cookies were sold in total. How many buns were sold and how cookies were sold?

2. On the lawn grew 35 yellow and white dandelions. After eight whites flew away, and two yellows turned white, there were twice as many yellow dandelions as white ones. How many whites and how many yellow dandelions grew on the lawn at the beginning?

3. Write the following as mathematical expression. If this expression is an equation, solve it:

    a. Difference between three times z and 4 is equal to12.

    b. Half of the number b is equal to 1.5

    c. Product of the numbers of 5 and x is less than 12.

4. Solve the following equations:

    a. $\left| x - \frac{1}{5} \right| = 2$ b. $\left| x : \frac{1}{2} \right| = 8$