The elimination method or the addition or subtraction method. Solving systems of equations, one variable is eliminated by adding or subtracting the equations. When adding two equations, you basically add all parts of them.

Say you had the equations:

$$\begin{cases} 2x + 3y = 5 \\ x - 3y = 1 \end{cases}$$

Adding them would give:

$$+\begin{cases} 2x + 3y = 5 \\ x - 3y = 1 \end{cases} \quad => \quad (2x + 3y) + (x - 3y) = 5 + 1$$

As you can see, that $3y$ and $-3y$ cancelled out, therefore eliminating the variable y, leaving an equation with only one variable (x), able to be solved.

<u>Notice:</u> that only because $3y$ and $-3y$, when added, produce 0 (cancel out), the equation can be solved. Their coefficients are opposites of each other. That is why it worked.

$3x = 6 \quad => \quad x = 2$

Now that you have a value for x you must find one for y. To do this, just substitute the value for x into either original equation, and solve it for y.

$$2 * 2 + 3y = 5 \quad => \quad 3y = 5 - 4 \quad => \quad 3\text{y} = 1 \quad => \quad \text{y} = \frac{1}{3}$$

Your solution for these two equations is $\left(2, \frac{1}{3}\right)$.

Try another one.

$$\begin{cases} 3x + 3y = 11 \\ 3x - 5\text{y} = 3 \end{cases}$$

These two equations, if added, do not help. Instead, you can subtract them. Subtraction is just addition of the opposite, so change <u>every</u> sign in one equation, and add it to the other.

$$-\begin{cases} 3x + 3y = 11 \\ 3x - 5\text{y} = 3 \end{cases} => (3x + 3y) - (3x - 5y) = 11 - 3$$

As you can see, that $3x$ and $-3x$ cancelled out, therefore eliminating the variable x, leaving an equation with only one variable (y), able to be solved.

$8\text{y} = 8 \quad => \quad y = 1$

Now that you have a value for y you must find one for x. To do this, just substitute the value for y into either original equation, and solve it for x.

$$3x - 5 * 1 = 3 \quad => \quad 3x = 8 \quad => x = \frac{8}{3} = 2\frac{2}{3}$$

Your solution for these two equations is $\left(2\frac{2}{3}, 1\right)$.