SIMULTANEOUS EQUATIONS

Here are the steps required to solve simultaneous equations:

	EQUATIONS TYPE 1	EQUATIONS TYPE 2	EQUATIONS TYPE 3	EQUATIONS TYPE 4
Line up the equations	2x + 3y = 18 2x - y = 2	3x - 2y = 1 4x + 2y = 20	8x + y = 28 (i) 2x - 3y = -6 (ii)	3x - 2y = 1 2x + 3y = 18
Check to see if the x values are the same	2x is common to both			
Check to see if the y values are the same		2y is common to both. Ignore signs.		
Make x or y the same. The choice is yours.			Make x the same: 8x Multiply eqn (ii) by 4 (i) 8x + y = 28 (ii) x 4: 8x - 12y = -24	Make y the same: 6y Multiply (i) by 3 and (ii) by 2 (i) x 3: 9x - 6y = 3 (ii) x 2: 4x + 6y = 36
Add or subtract to **eliminate** one letter **S**ame **S**igns **S**ubtract	Subtract: **4y = 16** x has been eliminated	Add: **7x = 21** y has been eliminated	Subtract: **13y = 52** x has been eliminated	Add: **13x = 39**
Find one letter	**y = 4**	**x = 3**	**y = 4**	**x= 3**
Substitute into one of the original equations to find the other letter	2x + 3(**4**) = 18 2x + 12 = 18 2x = 18 - 12 2x = 6 **x = 3 , y = 4**	4(**3**) + 2y = 20 12 + 2y = 20 2y = 20 - 12 2y = 8 **y = 4, x = 3**	8x + **4** = 28 8x = 28 - 4 8x = 24 **x = 3, y = 4**	2(**3**) + 3y = 18 6 + 3y = 18 3y = 18 - 6 3y = 12 **y = 4, x = 3**

Shopping with simultaneous equations.

If you went into a shop on Monday to buy 5 pencils and 2 rubbers and were charged 23 pence you would not be able to tell the price you were charged for the pencils or rubbers.
There are lots of possibilities if you include halfpennies.
Pencils could cost 1pand and rubbers could cost 9p.See if you can find another possibility.
We could let the cost of a pencil be x pence and the cost of a rubber could be y pence.

We could write an equation for Monday's bill: **5x + 2y = 23** **(i)**

If we went in on Tuesday and bought 3 pencils and 4 rubbers
we would be charged 25 pence if the prices hadn't changed since Monday.

We could write this as: **3x + 4y = 25** **(ii)**

Equations (i) and (ii) are simultaneous equations and may be solved to find **x** and **y**.