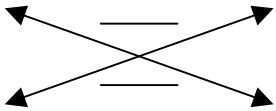
EQUATIONS

Learn two moves before you tackle the equations

Cross multiplication:

$\frac{topleft}{bottomleft} = \frac{topright}{bottomright}$ we can move diagonally through the "="



$\frac{a}{b} = \frac{c}{d}$ we could write $\frac{a}{1} = \frac{cb}{d}$ b moves

or $\frac{ad}{b} = \frac{c}{1}$ d moves

or $\frac{a}{c} = \frac{1}{d}$ c moves

or $\frac{1}{b} = \frac{c}{da}$ a moves

Now learn that if you change sides you have to change the sign.

$3x + 17 - 4x = 9x - 8$

all this stuff is on the left | all this stuff is on the right

the - 8 can move from the right to the left but we must **change the sign** to a +

$3x + 17 - 4x + 8 = 9x$

the 3x and the -4x can move to the right but **change the signs**

$17 + 8 = 9x - 3x + 4x$

now tidy each side up $25 = 10x$

finally slip the 10 to the bottom right using cross multiplication

$\frac{25}{10} = x$

$2.5 = x$

Some sums:

Opening line	$3x = 12$ x is tied up to a number	$3x + 5 = 20$ x is tied up and has a number on the same side	$\frac{x}{3} = 7$ x is on the top left	$\frac{15}{x} = 5$ x is on the bottom left it needs to be released up and swapped with the 5
Second line Cross multiply or change sides	$x = \frac{12}{3}$	$3x = 20 - 5$ $3x = 15$ $x = \frac{15}{3}$	$x = 7x3$ the 3 is moved from bottom left to top right	$\frac{15}{5} = x$ the x and the 5 have been swapped 
Finish	$x = 4$	$x = 5$	$x = 21$	$5 = x$

NOTE: There are only two basic moves but you must apply them sensibly.

A few more sums with **brackets** even:

Opening line	$\frac{x}{6} + 2 = 5$	$8y - 6 = 4y + 1$	$3(x - 2) + 8 = 2(x + 6) - 4$
Expand any brackets			$3x - 6 + 8 = 2x + 12 - 4$
Change sides	$\frac{x}{6} = 5 - 2$	$8y - 4y = 1 + 6$	$3x - 2x = 12 - 4 + 6 - 8$
Tidy up	$\frac{x}{6} = 3$	$4y = 7$	$x = 6$ (finished already!)
Cross multiply	$x = 3x6$	$y = \frac{7}{4}$	
Finish	$x = 18$	$y = 1¾$	