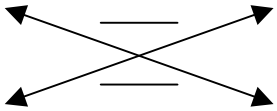
REARRANGING FORMULAE

Learn two moves before you tackle the questions

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.

x is on its own and is the subject of the formula: $\underline{x} = 5y - 12$

Make y the subject of the formula

the -12 can move from the right to the left but we must **change the sign** to a +

$$x + 12 = 5y$$

now slip the 5 to the bottom left using cross multiplication keeping the x + 12 together and so slipping the 5 under the whole of the left hand side.

$\frac{x+12}{5} = y$ **y is now on its own**

the subject of the formula is usually written first:

$$y = \frac{x+12}{5}$$

Keep the = under the =

Some Sums - Change the subject!

Opening line	$x = 4y - 3$ *x* is the subject of this formula	$3(a + 5) = b$ *b is the subject and a is tied up inside the bracket*	$p = \frac{x}{3} + 7$ *p is the subject and x is tied up with a fraction*	$t = \frac{5+v}{3}$ *t is the subject and v is tied up with the 5*
Second line Cross multiply, open out brackets or change sides	$x + 3 = 4y$ the -3 has changed sides the 4 needs to be slipped down	$3a + 15 = b$ expand the bracket or slip the 3 down $a + 5 = \frac{b}{3}$	$p - 7 = \frac{x}{3}$ the 7 has changed sides $(p - 7) = \frac{x}{3}$	$3t = 5 + v$ the 3 has slipped up to meet the t
Finish	$\frac{x+3}{4} = y$ write y first $y = \frac{x+3}{4}$	$3a = b - 15$ $a = \frac{b-15}{3}$ or $a = \frac{b}{3} - 5$ both answers are the same - prove it!	Slip the 3 up $3(p - 7) = x$ write x first $x = 3(p - 7)$ x is now the subject	$3t - 5 = v$ write v first $v = 3t - 5$ v is now the subject

A few more slightly harder sums

Opening line	$A = 3r^2$	$R = (w + 4)^2$	$C = \frac{5}{9}(F - 32)$
Expand any brackets or use square root Change sides Cross multiply Tidy up Finish	Slip the 3 down $\frac{A}{3} = r^2$ square root $\sqrt{\frac{A}{3}} = r$ $r = \sqrt{\frac{A}{3}}$	Square root both sides $\sqrt{R} = (w - 4)$ $\sqrt{R} = w - 4$ $\sqrt{R} + 4 = w$ $w = \sqrt{R} + 4$	Cross multiply the 9 Or cross multiply the 9 and 5 $9C = 5(F - 32)$ $9C = 5F - 160$ $9C + 160 = 5F$ $\frac{9C+160}{5} = 5F$ $F = \frac{9C+160}{5}$ $\frac{9}{5}C = F - 32$ $\frac{9}{5}C + 32 = F$ $F = \frac{9}{5}C + 32$ same answer Prove it!