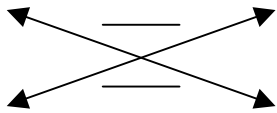


REARRANGING FORMULAE

Learn two moves before you tackle the questions

Cross multiplication:

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



$$\frac{a}{b} = \frac{c}{d} \quad \text{we could write}$$

$$\frac{a}{1} = \frac{cb}{d} \quad \text{b moves} \rightarrow$$

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

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

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

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.

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

the subject of the formula is usually written first:

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

↑
Keep the = under the =

Some Sums - Change the subject!

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

A few more slightly harder sums

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