Rearranging Formulae

Level 1 - Rearrange simple formulas with one step

Level 2 - Rearrange formulas with two or more steps

Rearranging formulas is is just another form of equation solving. We're finding a way to isolate one variable.

Formulas are often presented with a specific subject in mind. For example, the volume of a rectangular prism is give as ***V = bhl*** (Volume = base x height x length). We know **V is the subject** as it is alone on one side of the equation.

In order to change the subject we must rearrange the formula.

Just as we did with linear equation solving, **we isolate the term containing the variable we want, followed by isolating the variable itself**. We do this by undoing multiplication, division, addition, or subtraction in reverse order, using inverse operations.

We may need to undo roots, powers and other operations as well.

Example #1	Example #2	Example #3	Example #4
If the formula to find final velocity, **v**, is: $v = u + at$ rearrange to find the initial velocity, **u**.	If the formula to find gravitational potential energy, **PE**, is: $PE = mgh$ rearrange to find the height, **h**.	If the formula to find the power, **P**, in an electric circuit is: $P = I^2 R$ rearrange to find the current, **I**.	If the formula to find displacement, **s**, is: $s = ut + \dfrac{1}{2}at^2$ rearrange to find the acceleration, **a**.
$v = u + at$ $-at \qquad -at$ $\boxed{u = v - at}$	$\dfrac{PE}{mg} = \dfrac{mgh}{mg}$ $\boxed{h = \dfrac{PE}{mg}}$	$\dfrac{P}{R} = \dfrac{I^2 R}{R}$ $\dfrac{P}{R} = I^2$ $\boxed{I = \sqrt{\dfrac{P}{R}}}$	$s = ut + \dfrac{1}{2}at^2$ $s - ut = \dfrac{1}{2}at^2$ $2(s - ut) = at^2$ $\boxed{a = \dfrac{2(s - ut)}{t^2}}$

Remember:

- Keep the equation balanced. Whatever you do to one side, you must do to the other.
- Work backward. Undo operations in reverse order of how they're applied (last done, first undone).