

Title: Rearranging Formulae and Simultaneous Equations

Key Knowledge/Prior Learning KS2/3 and Retrieval and Suggested Starters

- Solving equations
- Graphical roots of equations
- Substitution

KS4 National Curriculum – what students will be practicing

- Rearrange formulae to change the subject
- Solve two simultaneous equations in two variables (linear / linear) algebraically
- Find approximate solutions using a graph
- Translate simple situations or procedures into algebraic expressions or formulae
- Derive two simultaneous equations
- Solve the equations and interpret the solution

Specific Ambitious Knowledge

Key Vocabulary/Literacy Opportunities

- Equations
- Solve
- Solution
- Unknown
- Coefficient
- Expand
- Subject
- Inverse
- Rearrange

Key Formulae/Knowledge

Every formula has a **subject**. The subject is the variable which is being computed.

- In the formula $F = ma$, F is the subject, which is the force.
- In the formula for the area of a triangle, $A = \frac{1}{2}bh$, A is the subject which is the area.

Rearranging harder equations

Fractions in equations make them harder to rearrange. Therefore, when fractions are involved, our first step should be to **eliminate** them, by multiplying both sides of the equation by the denominator of the fraction.

Rearranging equations can also be harder when we have **more than 2 variables**, or when our **subject** is **present in multiple terms**. When this happens, we should try and bring every term with our subject on one side and then factorise.

Linear simultaneous equations

To solve two linear simultaneous equations, we use **elimination**. One of the variables is eliminated by subtracting one equation from the other.

Non-linear simultaneous equations (Higher only)

Non-linear simultaneous equations appear when one of the equations is quadratic and the other is linear. To solve non-linear simultaneous equations, we use **substitution**. This is where the linear equation is substituted into the quadratic equation.

Maths in Context (Historical, Real Life and Student Thinking Points)

- A good introduction to simultaneous equations can be to use puzzles as students don't necessarily see it as algebra. More on this idea can be found [here](#).

Projects/Enrichment/Investigations

- [Arithmagons](#)
- [Warm snug Double Glazing](#)
- [CD Heaven](#)
- [Matchless](#)