**Y12 AS Mathematics**

**1 Problem Solving 0.5 week**

## Teaching objectives

**a** Understand and use the structure of mathematical proof, proceeding from given assumptions through a series of logical steps to a conclusion

**b** Use methods of proof, including proof by deduction, proof by exhaustion

**c** Understand and use disproof by counter example

**d** Use mathematical skills and techniques to solve challenging and unstructured problems which require a decision on the solution strategy

**e** Communicate the mathematical rationale for decisions clearly

**Resources for advance preparation:**

[**FMSP: Problem Solving Posters**](http://furthermaths.org.uk/manager_area/images/FMSP-Problem-Solving-Posters.pdf) – 1 of each you intend to use per pair

[**MEI: Points, lines and rectangles**](https://www.geogebra.org/m/HmnV33gj)– 1 copy of the instructions per pair

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|  | **Starter** | **Main teaching**  Including key questions, key teaching points, models and resources | **Notes**  Including Support and Extension | **Consolidation/Plenary**  Including key questions and homework |
| **1** | Use problems from [**FMSP: Problem Solving Posters**](http://furthermaths.org.uk/manager_area/images/FMSP-Problem-Solving-Posters.pdf)  These contain six problems which can be accessed by students starting A level Mathematics and provide an opportunity to focus on the three Overarching Themes. | | Pair strong with middle, middle with weak and be prepared to support any of the middle/weak pairings. | The focus should be on sharing and discussing problem solving strategies and proof, but it may also be appropriate to fill technical gaps.  **Homework:**   1. Download Geogebra onto phone 2. Set one of the problems for students to work on in pairs to encourage collaborative work from the start. |
| **2** | Students to share solutions to homework problem. | [**MEI: Points, lines and rectangles**](https://www.geogebra.org/m/HmnV33gj)  or continue with the six problems from the first lesson. | Points, lines and rectangles will give you an opportunity to demonstrate the power of Geogebra to students and get them started using the app. |