

# Using GeoGebra Classroom in Further Maths

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*The session will start at 13:00. Whilst you are waiting you can try the GeoGebra Classroom activities for this session:*

Go to: [geogebra.org/classroom](https://www.geogebra.org/classroom)  
 Enter the class code: **SWW28N2U**

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## Format of the session

- This session is in a **Zoom** webinar
- You can message us privately using **Q&A**
- You can interact in the session via a ***GeoGebra Classroom Activity***
- The session **will be recorded**

# Aims

- Demonstrate how GeoGebra classroom activities can be used in Further Maths
- Demonstrate how to get started with adapting, creating and setting GeoGebra classroom activities for students

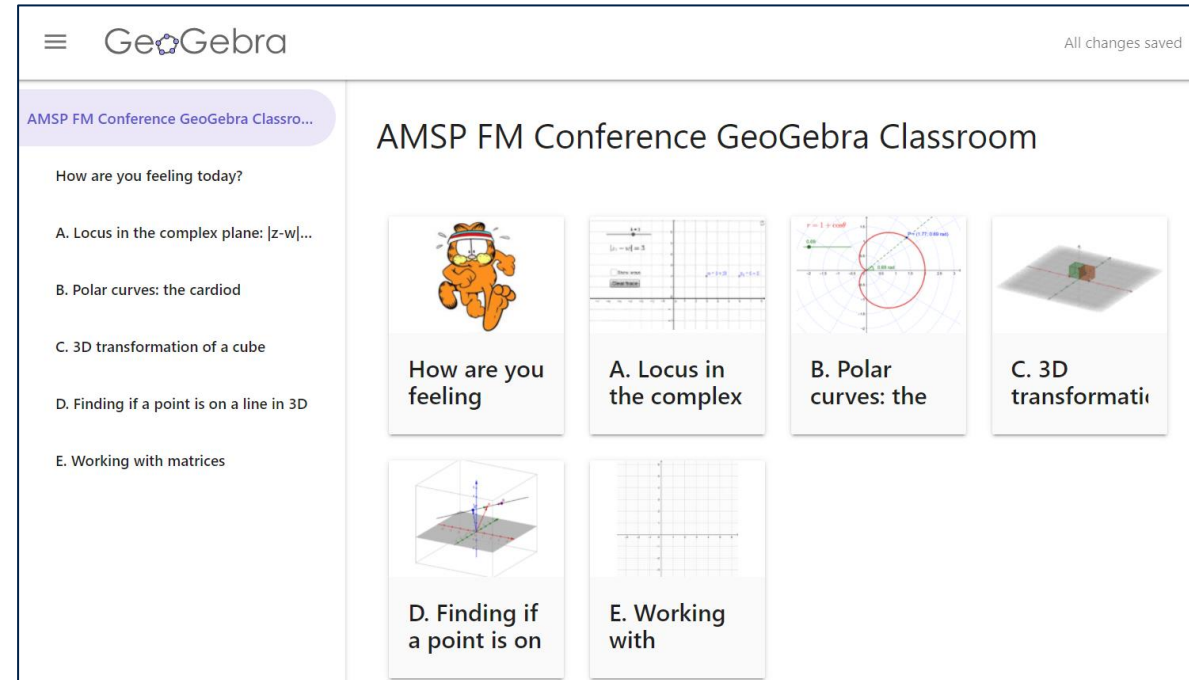
# Classroom activities

Go to GeoGebra classroom now and try an activity!

- Use the direct link [geogebra.org/classroom/sww28n2u](https://www.geogebra.org/classroom/sww28n2u)

or

- Go to: [geogebra.org/classroom](https://www.geogebra.org/classroom) enter the class code: **SWW28N2U**



The screenshot shows the GeoGebra classroom interface. At the top, it says "GeoGebra" and "All changes saved". Below that, the title "AMSP FM Conference GeoGebra Classroom" is displayed. On the left side, there is a list of activities:

- How are you feeling today?
- A. Locus in the complex plane:  $|z-w|...$
- B. Polar curves: the cardioid
- C. 3D transformation of a cube
- D. Finding if a point is on a line in 3D
- E. Working with matrices

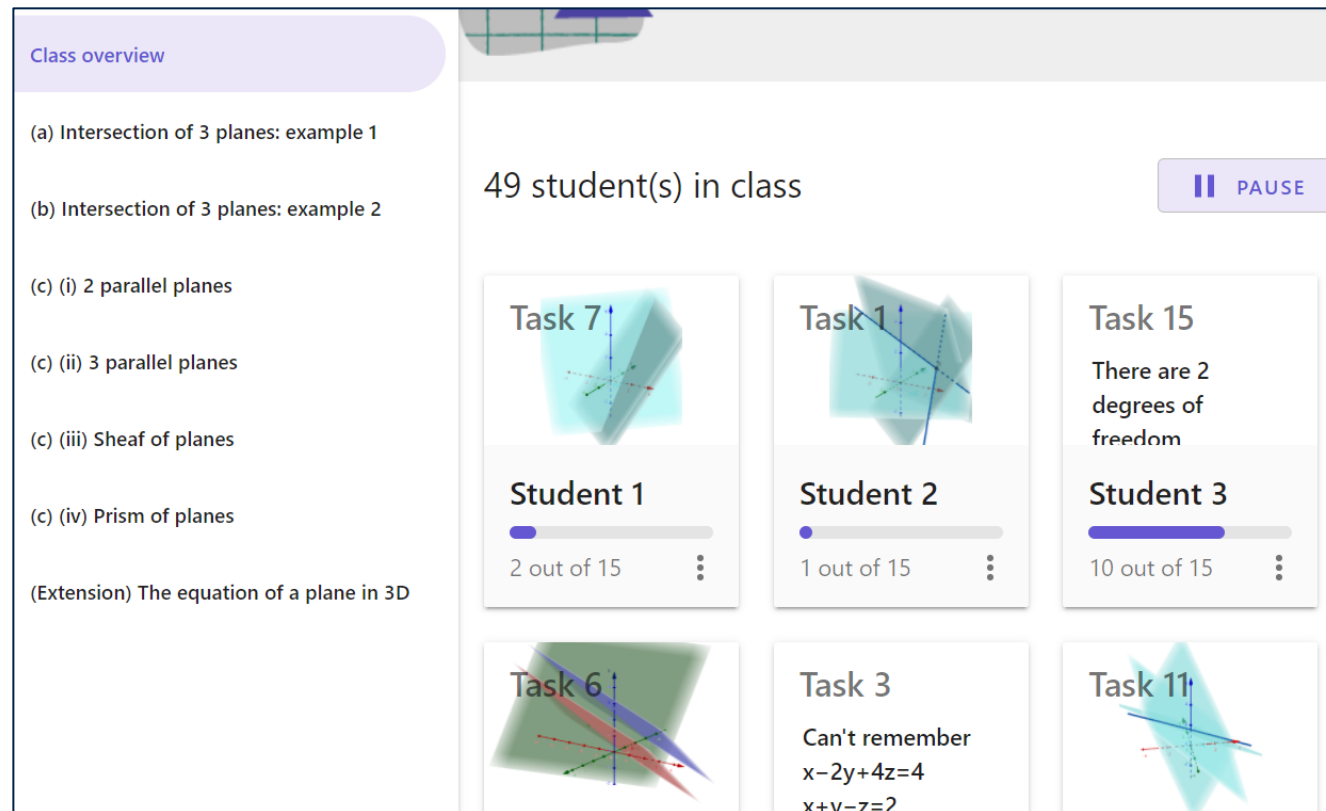
On the right side, there are six activity cards, each with a thumbnail image and a title:

- How are you feeling (with a Garfield cartoon)
- A. Locus in the complex (with a complex plane graph)
- B. Polar curves: the (with a polar plot of a cardioid)
- C. 3D transformati (with a 3D cube transformation)
- D. Finding if a point is on (with a 3D coordinate system)
- E. Working with (with a 2D coordinate system)

# Teacher view

## Key features:

- Class overview
- “Tasks” and responses
- Pause
- No pacing (yet!)
- Hide names



The screenshot displays the 'Teacher view' interface. On the left, a 'Class overview' sidebar lists topics: (a) Intersection of 3 planes: example 1, (b) Intersection of 3 planes: example 2, (c) (i) 2 parallel planes, (c) (ii) 3 parallel planes, (c) (iii) Sheaf of planes, (c) (iv) Prism of planes, and (Extension) The equation of a plane in 3D. The main area shows '49 student(s) in class' and a 'PAUSE' button. Below this, a grid of task cards is visible. Each card shows a task title, a 3D diagram of planes, a student name, a progress bar, and the number of responses out of 15. For example, 'Task 7' is shown for 'Student 1' with 2 out of 15 responses. 'Task 15' shows the text 'There are 2 degrees of freedom' for 'Student 3' with 10 out of 15 responses. 'Task 3' shows the equations  $x - 2y + 4z = 4$  and  $x + v - 7 = ?$  for 'Student 2' with 1 out of 15 responses. 'Task 11' is also visible.

# Adapting activities

- Find a GeoGebra activity you want to use
- Select “Copy activity” (3 dots top-right)
- Add some questions/more interactivity
- Rename and click Save
- View activity (eye top-right)
- Click create class

GeoGebra
CREATE CLASS

### Finding the distance between skew lines

**Author:** GeoGebra Institute of MEI

Use the sliders to find the values of  $\lambda$  and  $\mu$  such that the vector PQ is perpendicular to both lines.

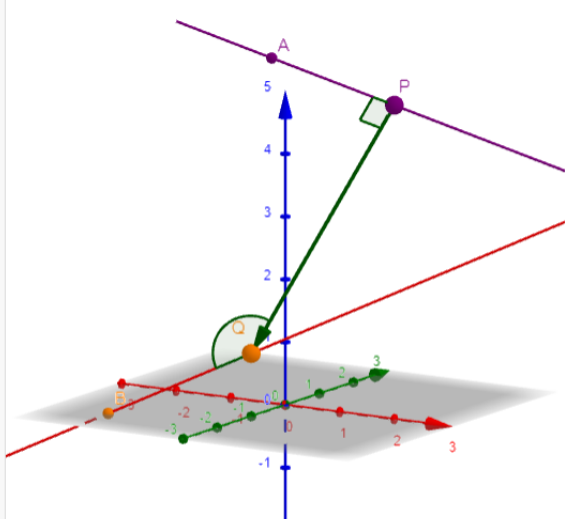
You can drag the axes around to move the view.

$$\begin{pmatrix} x \\ y \\ z \end{pmatrix} = \begin{pmatrix} 1 \\ -2 \\ 6 \end{pmatrix} + \lambda \begin{pmatrix} 1 \\ 2 \\ -1 \end{pmatrix}$$

$$\begin{pmatrix} x \\ y \\ z \end{pmatrix} = \begin{pmatrix} -2 \\ -2 \\ 0 \end{pmatrix} + \mu \begin{pmatrix} 2 \\ 1 \\ 1 \end{pmatrix}$$

$\lambda = 1$

$\mu = 1$

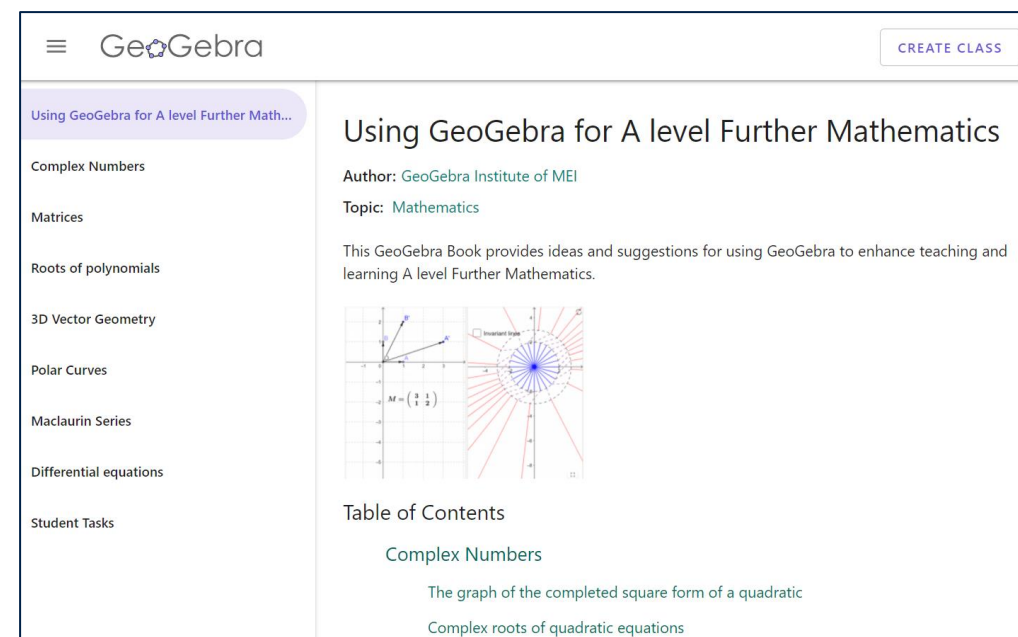


# Some useful tips

- Using 700×500 panels is best for applets
- You can upload a ggb applet
- You can copy an activity code into the new applet panel
- Sets of activities can be grouped in *books*
- Labelling activities a, b, c in books helps
- You can create folders to organise your resources
- It works well on phones
- Students don't need to login but if they do it saves changes
- You can add co-teachers via the share button
- Remote learning templates are available

# More to explore

- Learn GeoGebra Classroom  
[geogebra.org/m/hncrgruu](https://www.geogebra.org/m/hncrgruu)
- Remote learning templates:  
[geogebra.org/m/ckwrg8he](https://www.geogebra.org/m/ckwrg8he)
- MEI GeoGebra book for Further Maths:  
[geogebra.org/m/XGZP5tbZ](https://www.geogebra.org/m/XGZP5tbZ)
- Mark Willis resources (filter for books):  
[geogebra.org/u/mawi](https://www.geogebra.org/u/mawi)
- MEI GeoGebra page:  
[mei.org.uk/geogebra](https://www.mei.org.uk/geogebra)



The screenshot shows the GeoGebra website interface. On the left is a navigation menu with categories: Complex Numbers, Matrices, Roots of polynomials, 3D Vector Geometry, Polar Curves, Maclaurin Series, Differential equations, and Student Tasks. The main content area displays a book titled "Using GeoGebra for A level Further Mathematics" by the GeoGebra Institute of MEI. The topic is Mathematics. A description states: "This GeoGebra Book provides ideas and suggestions for using GeoGebra to enhance teaching and learning A level Further Mathematics." Below the text is a thumbnail image showing a coordinate plane with a matrix  $M = \begin{pmatrix} 1 & 1 \\ 1 & 1 \end{pmatrix}$  and a polar coordinate system. A "Table of Contents" section lists "Complex Numbers" with sub-items: "The graph of the completed square form of a quadratic" and "Complex roots of quadratic equations". A "CREATE CLASS" button is visible in the top right corner.



# Thank you!

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