



Innovators in
Mathematics
Education



MEI Conference 2016

GeoGebra for Beginners

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Session description: GeoGebra for Beginners

This is a session aimed at introducing some of the basic functionality of GeoGebra. The session will give opportunities for participants to create their own GeoGebra resources in order to aid effective teaching and learning in their classrooms. Examples will mainly be taken from AS Core Maths content, although the skills can be applied to topics across any key stage.

MEI GeoGebra Institute

MEI is a GeoGebra Institute. We support teachers and students through:

- face-to-face and online workshops for teachers;
- the design of free teaching and professional development materials for A level and GCSE Maths;
- online support for GeoGebra users;
- presentations at conferences.

There is more information available on the MEI GeoGebra Institute page: tube.geogebra.org/institute-mei

As a GeoGebra Institute we have created some self-study “How-to” guides in order to support learning how to use GeoGebra. These are available as GeoGebraBooks via our GeoGebra Institute page and also on the MEI Use of IT support page (see below for links). Currently available are the following four guides

- [Graphics/Algebra views and Graphics Style Bar](#)
- [Functions, Dynamic Text and Graphics 2](#)
- [Commands, Spreadsheets and Statistics](#)
- [Vectors, CAS and 3D views](#)

Useful links

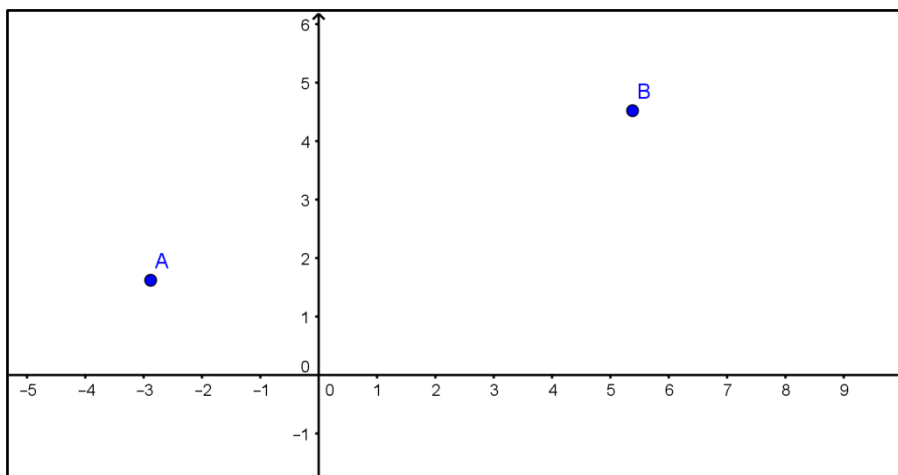
GeoGebra:	www.geogebra.org/
GeoGebra Tube:	www.geogebra.org/materials/
MEI Use of IT support page:	mei.org.uk/geogebra
MEI GeoGebra Institute page:	tube.geogebra.org/institute-mei



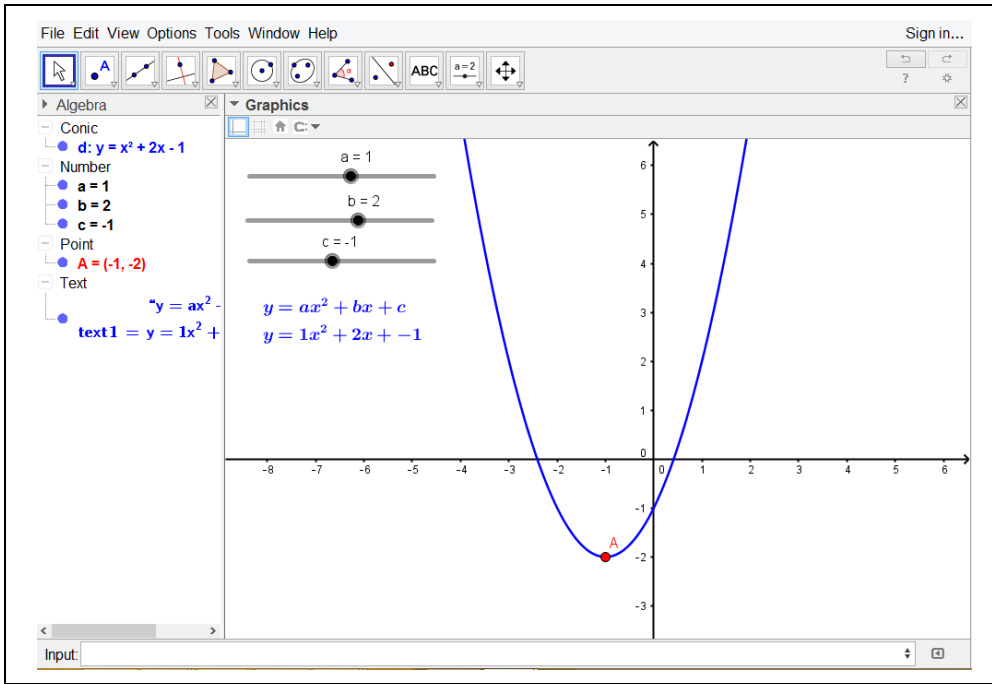
Opening problem: Finding the midpoint



Spend a few minutes thinking of the different mathematical ways for finding the midpoint of two points A and B . You may want to list them below.

Using GeoGebra see if you can reproduce some or all of your approaches.



1. Simple general quadratic

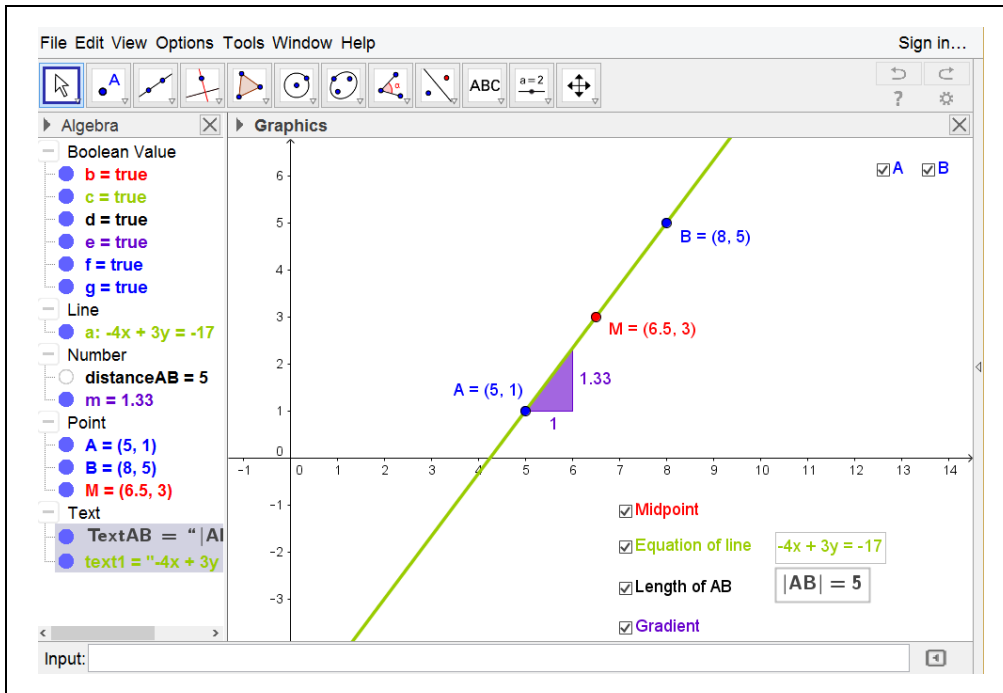









Slider	
Input bar	Input: <input type="text"/>
Insert Text	

Construction notes & thoughts about how this could be used in your classroom

2. Basic coordinate geometry

geogebra.org/m/Hy6JsvpM



New Point	
Line through Two Points	
Midpoint or Centre	
Check Box to Show/Hide Objects	
Copy Visual Style	
Distance or Length	
Slope	

Construction notes & thoughts about how this could be used in your classroom

Prompt A: Two simple circles

geogebra.org/m/uFsPZ5TJ

The screenshot shows the GeoGebra software interface. On the left, the 'Algebra' window lists objects: Boolean Value (Red_circle = true, Blue_circle), Conic (e: (x-1)² + (y-1)² = 1, f: (x-1)² + (y-1)² = 4), Number (Radius = 2, Radius₁ = 1), and Text (text1 = "(x - a)²", text2 = "(x - c)²"). The 'Graphics' window shows a coordinate plane with a red circle centered at (1, 1) with radius 1, and a blue circle centered at (1, 1) with radius 2. The equations and parameters are displayed above the circles.

Slider	
Circle with centre and radius	
Check Box to Show/Hide Objects	
Copy Visual Style	

Construction notes & thoughts about how this could be used in your classroom

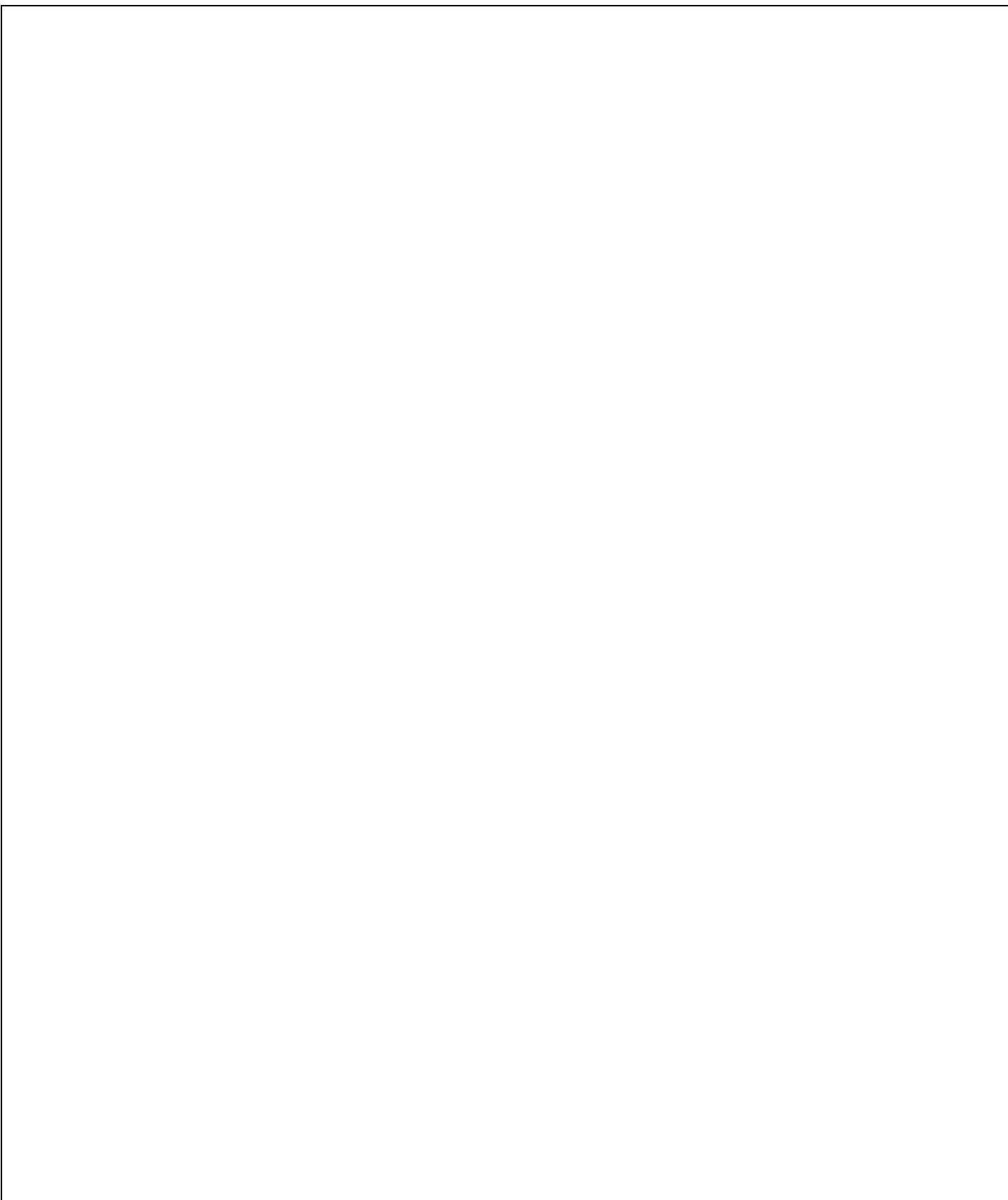
Blank area for construction notes and thoughts about how this could be used in your classroom.

Prompt B: Change one aspect....

Change one aspect of the equation $(x - 4)^2 + (y - 5)^2 = 25$ so that the point $(1,1)$ lies inside the circle.

Prompt C: Intersecting lines, tangents and a circle

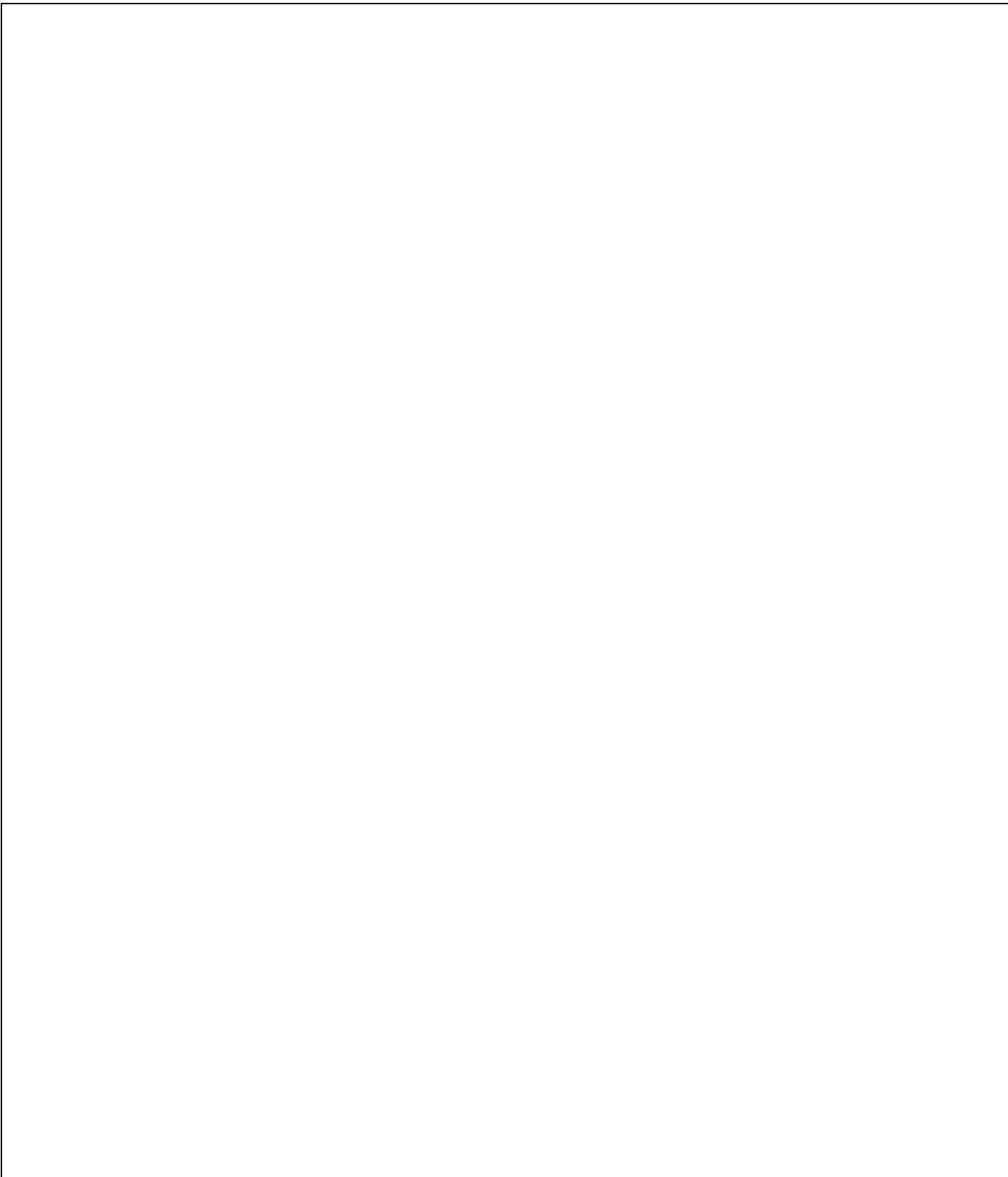
You are given two intersecting straight lines and a point P marked on one of them. Construct a circle that passes through P and has both lines as tangents.



Prompt D: Square construction

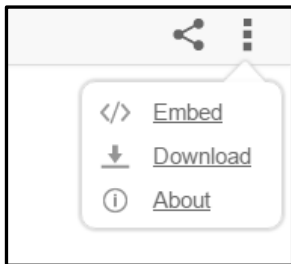
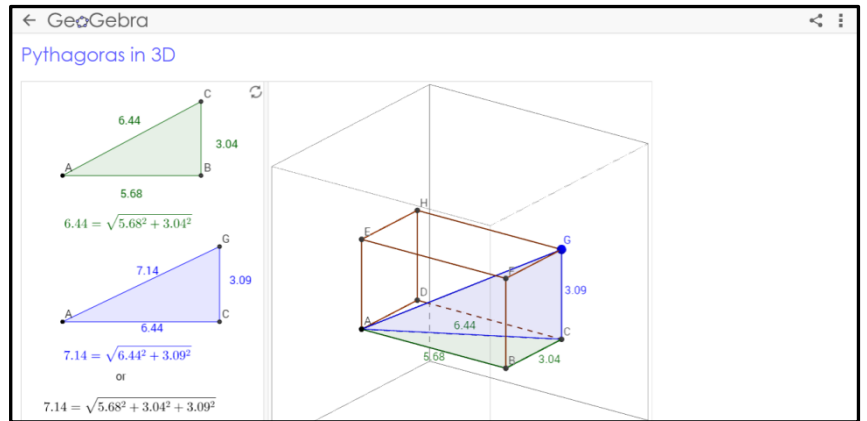
Construct a square with two of the vertices having coordinates $(3, 5)$ and $(5, 0)$.

Are there any different solutions? If so, what do you notice?



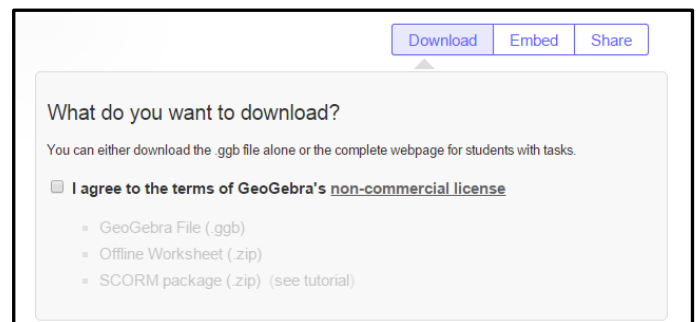
Downloading and editing material from GeoGebraTube

1. Open a file from GeoGebraTube you are interested in.



2. In the top right-hand corner of the screen click on the icon consisting of 3 squares.

3. Click on 'Download'. This takes you to an agreement.



4. Once you have done this you can save to your computer and the file is available for you to edit, save, etc, for use with students.

5. It can be useful to look at the 'Construction Protocol' for a file in order to see how it was created and to inform your editing. It will also help you as you learn more about the functionality of GeoGebra.

To see the Construction Protocol click on View > Construction Protocol and it will appear in a new View window. You can resize to suit.

