Title: **How to use Geogebra to teach the theorem of Pythagoras**

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Target audience:

Mathematics teachers Senior Phase in the General Education and Training Band (GET)

Motivation for Workshop (About 2 or 3 lines)

- To expose teachers to Geogebra & mathematics material that allows learners to construct mathematical concepts and knowledge through empirical experiences and by memorizing the Theorem of Pythagoras.
- The theorem of Pythagoras can be done by pen-and-paper activities but with Geogebra you can create in the same time far more activities to do more investigations and also give more accurate results. Dynamic software can be used to explore and visualise geometrical properties by dragging objects and transforming figures in ways beyond the scope of traditional paper-and-pencil geometry.
- "Learners must be exposed to meaningful problems and not given algorithms, definitions and rules. "Few people know that mathematics is an activity. Little children are taught mathematics as an activity, but as they mature into rational beings, we are prone to teach them a well-organized prefabricated deductive system of mathematics, because rational beings may be supposed to understand deductive systems. You know that it does not work very well."(Freudenthal, Geometry between the Devil and the Deep Sea, 1971).

Content of workshop (About 5-10 lines to entice the audience to your workshop)

Participants will:

- Explore software to familiarise themselves with the working of the software.
- Explore the rule that states when it's possible or not to enclose triangle with any three lengths.
- Explore the rule that states when a triangle is acute, obtuse or right-angled.

PROPOSED TIME ALLOCATION FOR WORKSHOP ACTIVITIES

Presenter gives a brief presentation on Geogebra and what you can do with Geogebra.	**10 minutes**
Participants to familiarise themselves with Geogebra.	**15 minutes**
Participants will construct in Geogebra 3 line segments to determine when a triangle can be enclosed or not.	**20 minutes**
Participants will construct in Geogebra 3 line segments (that can enclosed a triangle) with squares on each line segment to determine if the triangle is acute, obtuse or right-angled.	**30 minutes**
Participants will construct in Geogebra 3 a right-angled triangle to explore the theorem of Pythagoras.	**15 minutes**
Participants will use the theorem of Pythagoras to find the length of unknown sides without using Geogebra.	**15 minutes**
Related discussions and installation of software.	**15 minutes**