Simultaneous Equations, with Modulus*

In a Year 12 lesson about simultaneous modulus equations, students are asked the following question:

“Give two modulus functions which have graphs that intersect only once.”

The teacher and the students have access to the Geogebra software.

After a while, the following conversation occurs:

Student A: The two modulus functions that I found are \( y = |x| \) and \( y = 2|x| \).

Student B: I found a different pair: \( y = |x-4| \) and \( y = 2|x| \).

Teacher: Let’s check these solutions in GeoGebra.

The teacher produces the graphs of Student A’s and B’s suggestions in GeoGebra.

Questions:

a. What do you think are the issues emerging from the solutions proposed by Students A and B?

b. What are the aims of doing this activity in class?

c. If you were the teacher, what would you do next, in relation to responding to each of these students and to the whole class?

d. How would you use the GeoGebra software, or another software, to support your responses to the above?

**Inspired by the doctoral research of Lina Kayali

This is a Task developed by the MathTASK 2016-17 team. Let us know whether it is useful and how we can improve it at @mathtask or email Irene Biza at i.biza@uea.ac.uk. For more tasks, visit MathTASK.