

Assignment title: Triangles on Grids

Course: Discrete Mathematics

University: Saint Mary's College

Faculty: Ranjan Rohatgi

Details about the audience and course context

- How many students are in the class? 20-25
- What is the teaching modality (in person, virtual, hybrid)? in-person
- What grade level/year are the majority of students? Ranges from sophomores to seniors
- Where does this course fall in the curriculum? (Is it in the core or organized within a particular course of study?) The course is for math majors
- What virtues are integrated into the course: curiosity, beauty, and perseverance

Assignment

Triangles on Grids

- Suppose you have a square grid of 9 points (I'm going to call this a "3 by 3" grid) as shown below.



- How many different triangles can we draw on this grid assuming the vertices of the triangles are on points of the grid?
- What if you have a 4 by 4 grid?
- What if you have a 5 by 5 grid?
- Discuss how you would answer the question for a 6 by 6 (or larger) grid.
- Ask an interesting question based on these scenarios, generalizing or slightly changing them in some way. Discuss this new problem and how you could attempt to solve it. Maybe solve a special case or two.
- Curiosity: Pick your favorite topic that we have covered up to this point. Mathematically, why do you find it interesting? What makes you curious to know more about it?

