STAR POLYGONS: SCRIPTING TASKS AS A TOOL FOR RECORDING MATHEMATICAL INVESTIGATIONS

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THEME:

Teacher education and professional learning in STEM

BACKGROUND AND AIMS

Research indicates that investigating phenomena, rather than reproducing facts, should be a core experience in the education of prospective mathematics teachers (e.g., Da Ponte, 2007). But despite its centrality to quality teacher education, it is still unclear how best to analyze the effects of investigative tasks on teachers' mathematical understanding and beliefs. In this study, we demonstrate the potential of scripting tasks (e.g., Zazkis & Zazkis, 2014) as one avenue for capturing mathematical progress during an investigation.

METHODOLOGY

Participants were comprised of prospective teachers in their final semester of a teacher preparation program as well as practicing teachers in a professional development course. In groups, participants explored the concept of a "star polygon" (see Figure 1) and recorded their conflicts, ideas, and conclusions as a scripted dialogue. We analyzed their submissions using the construct of advancing mathematical activity (Rasmussen et al., 2005; Rasmussen et al., 2015), which allowed us to explore the interplay between participants' use of symbols, definitions, algorithms, and theorems within their investigations.

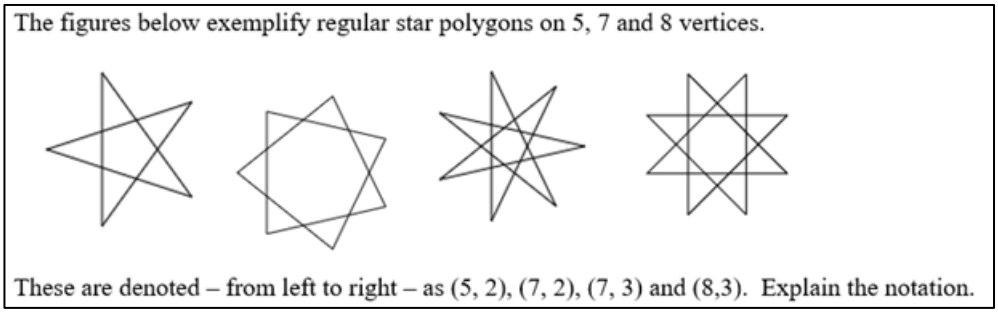

Fig 1: The initial prompt of the star polygons task.

RESULTS AND CONCLUSIONS

Our findings, which consist of examples of advancing mathematical activity from submitted scripts, demonstrate that scripting tasks can serve as a robust method for observing and analyzing investigative mathematical activity.

Analysis of our findings also examines the role of examples in investigative tasks, in particular highlighting how examples contribute to (and in some cases, detract from) the advancement of participants' mathematical activity. We conclude by considering the potential of the star polygons task as a foundation for directed discovery in an abstract algebra or number theory course.

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