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## THE RATIONAL FUNCTIONS UNIT

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This unit of Mathematical Investigations III (MI3) has been recently redesigned by Mark Kammrath of IMSA's mathematics faculty. Revisions are motivated by several considerations:

1. Research indicates that students can learn better when they are given attainable learning goals.
2. Students have been used to doing their worksheets in class, and as a result, many have not been motivated to do significant work outside of class. It is important to make out-of-class expectations clear.
3. In-class time is valuable. In order to truly implement inquiry-based learning in class, there must be sufficient time for guided explorations.
4. To make other assignments more meaningful (such as Problem Sets), it is important to discuss significant topics in class.

Summary of unit (see web site for copies of handouts); note difference between “activity” (more guided) and “exploration” (more open-ended):

Day 1 Group activity using technology (Winplot). Separate HW assignment.

Day 2 Exploration on rational functions. Use of sliders in Winplot has students actively engaged. Students complete exploration for HW.

Day 3 Class discussion on exploration. Separate HW assignment; selected answers are given to students so they can check their work.

Day 4 Second exploration on rational functions; less “hand-holding” as expectations for explorations were set earlier. Students self-direct. Separate HW (with selected answers).

Day 5 Group activity on rational functions with separate HW. Table quiz.

Day 6 Worksheet on writing rational functions (with selected answers projected on screen). Separate HW.

Day 7 Critical thinking with error analysis. Review worksheet for HW.

Day 8 Work on rational inequalities.

Day 9 Unit test.