

## Points of Emphasis in M203

Whereas a typical instructional unit on polynomial and rational exponents, functions, and equations might begin with a focus on students performing computations or manipulating expressions, functions, and equations disconnected from real-world contexts, in M203, students should:

- recognize that polynomials form a system analogous to the integers (LP 1).
- communicate the importance and benefit gained from writing polynomial and rational expressions in a variety of forms (LP 3).
- Solve contextual problems using equivalent forms of expressions (LP 1).
- discover and explain the connections that exist between the Remainder Theorem and their evolving understanding of what a factor is (LP 3).
- regularly encounter real-world tasks involving polynomial equations (LP 1) that require them to make sense of multiple representations and how they relate to each other—verbal, algebraic, numerical, graphical (LP 3).
- be able to choose tasks that are organized around different scientific, social, or other topics, allowing students to have agency in their learning (LP 4).
- frequently collaborate, share their solution methods, and make their thinking visible (LP 2).
- regularly engage with tasks that focus on understanding and reasoning about different representations—verbal, algebraic, numerical, graphical. As examples, students should engage with the following:
  - Reason about and interpret expressions that represent a quantity in terms of its context (LP 3).
  - Construct rough graphs for polynomial functions by using their zeros and make sense of what the zeros mean for the graph (LP 3).
  - Use structure of polynomial and rational expressions to make connections between the different representations to rewrite in equivalent forms (LP 3).
  - Reason about numerical relationships that can be rewritten using polynomial identities (LP 3).
  - Use multiple representations (table, graph, and symbols) to calculate the average rate of change (LP 3).
- use open-ended tasks to interpret data, analyze graphs, and reason about the context (LP 3).
- have opportunities to share their reasoning with partners or in groups, allowing for practice sharing, critiquing, and revising their arguments and including social interaction as part of the learning process (LP 2).

Students should also be given opportunities to understand and reflect on the ways that polynomial and rational exponents, functions, and equations can authentically represent real-world situations (LP 6).

Often, coursework with polynomial and rational exponents, functions, and equations is focused on performing computations by hand. Instead, students should be given frequent opportunities to:

- use spreadsheets and graphing software to allow for focus on understanding, rather than computation or symbolic manipulation (LP 7).